

**REPORT**

Superfund Records Center  
SITE: SULLIVAN'S LEDGE  
BREAK: 7.2  
OTHER: 558079

**Quarterly Ground Water  
Sampling Event  
Spring 2003**

**Sullivan's Ledge Superfund Site  
New Bedford, Massachusetts**

**June 2003**



**O'BRIEN & GERE**  
ENGINEERS, INC.

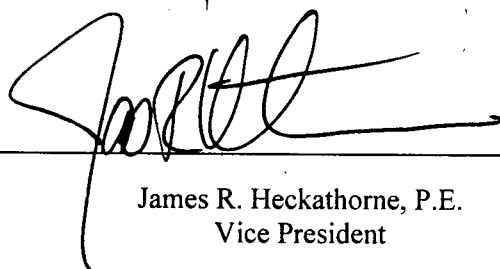


SDMS DocID 558079

# REPORT

## Quarterly Ground Water Sampling Event Spring 2003

*Sullivan's Ledge Superfund Site  
New Bedford, Massachusetts*



---

James R. Heckathorne, P.E.  
Vice President

June 2003



**O'BRIEN & GERE**  
ENGINEERS, INC.

---

## Contents

List of Tables .....	ii
List of Figures .....	ii
List of Appendices .....	ii
<b>1. Introduction .....</b>	<b>1</b>
1.1. Purpose and objective .....	1
1.2. Deviations from field sampling plan (FSP) .....	1
<b>2. Summary of field activities and analytical results.....</b>	<b>3</b>
2.1. Well locations .....	3
2.2. Qualitative well integrity testing .....	3
2.3. Conventional ground water monitoring wells.....	3
2.4. Westbay monitoring wells .....	4
2.5. Ground water recovery samples.....	4
2.6. Validated results.....	4
2.7. Analytical results.....	5
<b>3. Summary, conclusions, and recommendations.....</b>	<b>6</b>
3.1. Summary .....	6
3.2. Conclusions.....	6
3.3. Recommendations.....	7

## List of Tables

- 1 Ground Water Data Summary (VOCs)
- 2 Ground Water Data Summary (PCBs)
- 3 Ground Water Data Summary from Recovery Systems (VOCs)
- 4 Ground Water Data Summary from Recovery Systems (PCBs)
- 5 Ground Water Data Summary from Recovery Systems (Metals)

## List of Figures

- 1 Overburden Well Location Map
- 2 Shallow Bedrock Well Location Map
- 3 Intermediate Bedrock Well Location Map
- 4 Deep Bedrock Well Location Map

## List of Appendices

- A Correspondence
- B Conventional Low-flow Ground Water Sampling Logs, Instrument Calibration Logs, Chain-of-Custodies, Ground Water Elevation Data Tables
- C Westbay Well Sampling Logs
- D Spring 2003 Data Validation Report

---

## **1. Introduction**

### **1.1. Purpose and objective**

The Spring 2003 quarterly ground water monitoring event was conducted at Operable Unit 1 of the Sullivan's Ledge Superfund Site from March 17 through March 20, 2003. Assisting O'Brien & Gere Engineers, Inc. (O'Brien & Gere) with this program were Mabbett & Associates, Inc. (M&A) and Alpha Analytical Labs (Alpha). M&A provided field sampling services and related consultation while Alpha provided analytical services. Sampling was conducted in accordance with the Final Field Sampling Plan (FSP) submitted to EPA and Metcalf & Eddy (M&E) in January 2000, as amended by M&A letters dated March 14 and March 16, 2001, an O'Brien & Gere letter dated February 11, 2002, and electronic mail from the Sullivan's Ledge Site Group dated March 22, 2002. Copies of the M&A and O'Brien & Gere letters and the Group's electronic mail are included in Appendix A.

The purpose of the quarterly monitoring report is to discuss the field work associated with the Spring 2003 quarterly sampling event, and to present data obtained during the sampling event. Upon completion of the Winter 2003 quarterly monitoring event, an annual report will be generated to provide information regarding the Winter 2003 monitoring event, and will include tables and figures and discussion relative to historical data trends.

### **1.2. Deviations from field sampling plan (FSP)**

The following deviations from the FSP were made during the Spring 2003 quarterly sampling event in accordance with the February 11, 2002 approved plan for the Ground Water Monitoring Program:

- Ground water samples were obtained from eight conventional monitoring wells (Overburden wells MW-6A, MW-14 and MW-15, Shallow bedrock wells MW-2, MW-4, MW-6, MW-24 and GCA-1) and from ten ports from two Westbay wells (ECJ-1 and ECJ-2.) All samples were analyzed for select volatile organic compounds (VOCs) and six samples were analyzed for polychlorinated biphenyls (PCBs).
- In addition to collecting samples from monitoring wells, ground water samples were collected from the shallow collection trench and the six bedrock recovery wells from ports within the ground water

treatment plant. Samples were analyzed for select VOCs, PCBs, and eight select metals.

The following deviations from the FSP were also made during the Spring 2003 sampling event:

- Consistent with previous sampling events, the quantity of water sampled from each Westbay well sampling port for PCB analysis was decreased by one liter to streamline the sampling process.
- Turbidity at monitoring wells GCA-1, MW-2, MW-6A, MW-14, and MW-24 did not fall below the EPA guidance on low flow sampling criteria of 1 NTU. However, following purge times of 55, 40, 95, 70 and 110 minutes, respectively, the last three consecutive readings reported turbidity within 10%. Therefore, according to U.S EPA guidance, stabilization had been achieved and the wells could be sampled. With the exception of MW-24, stabilized turbidity values of less than 5 NTU were achieved, as has generally been observed in previous quarterly sampling events.
- Site-wide groundwater elevation data was not collected prior to the Spring 2003 sampling event because the groundwater treatment plant had not been operating continuously in the days leading up to the event. A complete round of groundwater elevation data was collected on March 25, 2003 following five days of continuous operation of the groundwater treatment facility. Water levels were also collected at Westbay and conventional wells during the sampling program as part of characterization associated with sampling, as indicated on the corresponding field log. The ground water elevation data is provided in Appendix B.

---

## **2. Summary of field activities and analytical results**

### **2.1. Well locations**

The locations of overburden, shallow bedrock, intermediate bedrock, and deep bedrock monitoring wells (including Westbay wells) are shown on Figures 1, 2, 3, and 4, respectively.

### **2.2. Qualitative well integrity testing**

During the Spring 2003 sampling event, M&A observed individual wells prior to sample collection, and noted no changes from conditions observed in the integrity tests conducted during previous inspections.

### **2.3. Conventional ground water monitoring wells**

A total of eight conventional ground water monitoring wells were purged and sampled in accordance with the FSP and the QAPP through the use of an EPA-approved low-flow bladder pump system dedicated to each well.

Prior to sampling, purged ground water was monitored in a flow-through cell on-site for the parameters described in Section 2.5 of the FSP. Equipment used to perform the characterization was calibrated and used in accordance with the standards and protocols provided in Section 3.6 of the QAPP.

Following purging, sampling of the conventional wells was completed using procedures described in Section 2.6 of the FSP. Sampling logs and instrument calibration logs are provided in Appendix B of this report.

Samples were packed on ice and sent to Alpha Analytical Labs under a chain-of-custody (COC) for twelve select VOCs and PCBs analyses by methods described in Section 2.1 of the FSP, as amended by the O'Brien & Gere letter dated February 11, 2002, included in Appendix A. Copies of the chain of custodies are included in Appendix B. Trip blanks were shipped with coolers submitted to the laboratory in accordance with Section 3.5 of the QAPP.

Quality Assurance/Quality Control (QA/QC) samples were also collected in accordance with Section 3.5 of the QAPP. MS/MSD samples were collected from bedrock well GCA-1 on March 19, 2003.

## **2.4. Westbay monitoring wells**

Two Westbay bedrock wells (ECJ-1 and ECJ-2) were sampled during the Spring 2003 ground water sampling event. Westbay field sampling logs are provided in Appendix C.

Consistent with Section 2.6 of the FSP, ground water from the Westbay ports was directly sampled without prior purging or characterization. Samples collected from the Westbay bedrock wells were packed on ice and shipped under a COC to Alpha Analytical Labs for twelve select VOCs in accordance with the procedures outlined in Section 2.1 of the FSP, as amended by the O'Brien & Gere letter dated February 11, 2002, included in Appendix A. Trip blanks were shipped with coolers submitted to the laboratory in accordance with Section 3.5 of the QAPP.

QA/QC samples were also collected. Duplicate sample #1 was collected on March 17, 2003 from ECJ-2-47. An equipment blank from the Westbay sampling equipment was collected on March 17, 2003.

## **2.5. Ground water recovery samples**

Samples were collected from the shallow collection trench and the six bedrock recovery wells using the installed taps in the ground water treatment plant.

QA/QC samples were also collected. Duplicate sample #2 was collected from recovery well BEI-2 on March 18, 2003. MS/MSD samples were collected from recovery well BEI-3 on March 18, 2003.

Samples were packed on ice and shipped under a COC to Alpha Analytical Labs for twelve select VOCs, PCBs, and eight select metal analyses.

## **2.6. Validated results**

Validated data from the Spring 2003 sampling round is included in the data validation report provided in Appendix D. The validated data has been downloaded into a Microsoft FoxPro relational database management system (DBMS) to facilitate future data management and trend analysis.



## 2.7. Analytical results

Tables 1 and 2 present the range of detected constituents in the ground water monitoring wells for twelve select VOCs and PCBs, respectively. A review of the tables suggests the following:

- Of the twelve VOCs analyzed for, cis-1,2 dichloroethene and vinyl chloride are present at the highest concentrations. The highest levels of VOCs were found at ECJ-1 and ECJ-2.
- PCBs were detected infrequently during the Spring 2003 sampling event. The highest level of PCBs (Aroclor 1242/1016) in the monitoring wells was detected at MW-24. The elevated level of PCBs in MW-24 could be related to the elevated turbidity values during sampling.

Tables 3, 4, and 5 present the range of detected constituents at the shallow collection trench and six bedrock recovery wells for twelve select VOCs, PCBs, and eight select metals, respectively. A review of the tables suggests the following:

- Of the twelve VOCs analyzed for, cis-1,2 dichloroethene and trichloroethene are present at the highest concentrations. The highest levels of VOCs were found at BEI-1.
- PCBs were detected infrequently during the Spring 2003 sampling event. The highest level of PCBs (Aroclor 1254) was detected at OBG-1.
- Barium was detected in each sample ranging from 0.13 to 1.6 mg/L. Iron was also detected in each sample ranging from 2 to 84 mg/L. Lead was detected in five of the seven samples at concentrations up to 0.017 mg/L. Aluminum, chromium, and zinc were detected in one sample at 0.15 mg/L, 0.01 mg/L, and 0.3 mg/L, respectively. Copper and vanadium were not detected in any of the seven samples.

The 2003 annual monitoring report will include tables and contour maps showing VOC concentrations in the overburden and bedrock depth intervals, ground water flow maps, and a detailed discussion relative to historical trends in concentrations.

---

### 3. Summary, conclusions, and recommendations

#### 3.1. Summary

A scope of quarterly ground water monitoring consistent with the 2002 sampling events was performed to establish a database for future evaluation of data trends. The more comprehensive annual sampling event will be conducted during in December 2003.

A total of eight conventional wells and ten ports from two Westbay wells were sampled during the Spring 2003 ground water sampling event. Analysis was conducted for twelve select VOCs (18 samples) and PCBs (6 samples). Samples were also collected from the shallow collection trench and the six bedrock recovery wells using sample taps in the ground water treatment plant. Analysis was conducted for twelve select VOCs (7 samples), PCBs (7 samples), and eight select metals (7 samples). Analytical results were validated and downloaded into a Microsoft FoxPro relational database management system to facilitate data management and trend analysis that will be addressed in the 2003 annual report.

#### 3.2 Conclusions

Some conclusions that can be drawn based on the Spring 2003 data (presented in Appendix D) are as follows:

##### VOCs

Consistent with the previous sampling reports, the concentrations of VOCs in the ground water samples continue to fluctuate. The maximum concentration of each detected VOC was less than the maximum concentrations detected during the Winter 2002 sampling event with the exception of 1,4-dichlorobenzene, trichloroethene, and vinyl chloride. The increases in maximum detected concentrations of 1-4-dichlorobenzene and trichloroethene were slight (5 ppb at MW-2 and 100 ppb at MW-24, respectively.) The increase in the maximum concentration of vinyl chloride may be indicative that the VOCs are naturally attenuating by reductive dechlorination.

#### PCBs

A review of Tables 2 and 4 confirms that PCBs continue to be detected infrequently and at low concentrations, and only in wells that also show detections of VOCs.

#### Metals

The concentrations of metals in the shallow collection trench and the bedrock recovery wells continue to be consistent.

### **3.3 Recommendations**

Consistent with the recommendations included in the Winter 2002 Annual Monitoring Report, the results of the quarterly monitoring events will continue to be evaluated to identify any trends in the data to evaluate future data collection needs and to identify any potential adjustments of the scope of future monitoring events to minimize collection of data that may not present any meaningful information. At this time, no adjustment to the June 2003 monitoring event is recommended.



Table 1  
Sullivan's Ledge Superfund Site  
Spring 2003 Monitoring Event  
Ground Water Data Summary  
Volatile Organic Compounds<sup>1</sup>

Constituent	Number of Samples	Number of Detects	Range (µg/L)	
			Low	High
1,4-Dichlorobenzene	18	3	2.5U	50
Benzene	18	10	10U	2100
Chlorobenzene	18	8	5U	170
Ethylbenzene	18	9	0.5U	1700
Napthalene	18	3	2.5U	17
Toluene	18	8	1.9U	1900
Trichloroethene	18	3	0.5U	1100
Vinyl chloride	18	15	2.5U	23000
cis-1,2-Dichloroethene	18	15	1.2U	39000
o-Xylene	18	2	0.5U	2.3
m,p-Xylenes	18	3	0.5U	5.5
trans-1,2-Dichloroethene	18	1	0.75	8.9

1. A total of 12 VOCs analyzed using method 8260B.
2. U - Indicates that the compound was analyzed for, but was not detected.

Table 2  
Sullivan's Ledge Superfund Site  
Spring 2003 Monitoring Event  
Ground Water Data Summary  
PCBs<sup>1</sup>

Constituent	Number of Samples	Number of Detects	Range (µg/L)	
			Low	High
Aroclor 1242/1016	6	3	0.5 U	26.1

Notes:

1. A total of 6 PCB compounds analyzed using method 8082B. Only detected compounds shown.
2. U - Indicates that the compound was analyzed for, but was not detected.

Table 3  
Sullivan's Ledge Superfund Site  
Spring 2003 Monitoring Event  
Ground Water Data Summary from Recovery Systems<sup>1</sup>  
Volatile Organic Compounds<sup>2</sup>

Constituent	Number of Samples	Number of Detects	Range (µg/L)	
			Low	High
1,4-Dichlorobenzene	7	1	2.5U	5.4
Benzene	7	5	100U	360
Chlorobenzene	7	5	250U	240
Ethylbenzene	7	6	25U	1300
Naphthalene	7	1	2.5U	12
Toluene	7	4	0.75U	990
Trichloroethene	7	5	0.5U	8400
Vinyl chloride	7	6	1U	1100
cis-1,2-Dichloroethene	7	7	1.7	22000
o-Xylene	7	1	0.5U	1
m,p-Xylenes	7	1	0.5U	2.8
trans-1,2-Dichloroethene	7	1	0.75U	19

Notes:

1. Samples collected from shallow collection trench and bedrock recovery wells BEI-1, BEI-2, BEI-3, OBG-1, OBG-2 and OBG-3.
2. A total of 12 VOCs analyzed using method 8260B.

**Table 4**  
**Sullivan's Ledge Superfund Site**  
**Spring 2003 Monitoring Event**  
**Ground Water Data Summary from Recovery Systems<sup>1</sup>**  
**PCBs<sup>2</sup>**

Constituent	Number of Samples	Number of Detects	Range (µg/L)	
			Low	High
Aroclor 1242/1016	7	5	0.5U	11.8
Aroclor 1254	7	6	0.5U	42.2

Notes:

1. Samples collected from shallow collection trench and bedrock recovery wells BEI-1, BEI-2, BEI-3, OBG-1, OBG-2, and OBG-3.
2. A total of 6 PCB compounds analyzed using method 8082B. Only detected compounds shown.



Table 5  
Sullivan's Ledge Superfund Site  
Spring 2003 Monitoring Event  
Ground Water Data Summary from Recovery Systems<sup>1</sup>  
Metals<sup>2</sup>

Constituent	Number of Samples	Number of Detects	Range (mg/L)	
			Low	High
Aluminum	7	1	0.1U	0.15
Barium	7	7	0.13	1.6
Chromium (total)	7	1	0.01U	0.01
Copper	7	0	0.01U	0.01U
Iron	7	7	2.0	84
Lead	7	5	0.005U	0.017
Vanadium	7	0	0.01U	0.01U
Zinc	7	1	0.05U	0.3

Notes:

1. Samples collected from shallow collection trench and bedrock recovery wells BEI-1, BEI-2, BEI-3, OBG-1, OBG-2, and OBG-3.
2. A total of 8 metal compounds analyzed using method 6010B/7470A. All analysis shown.
3. U - Indicates that the compound was analyzed for, but was not detected.



DWG PATH: I:\DIV71\PROJECTS\5509005\DWG\71\002.DWG (XREF DWG: SITEBASE.DWG)

PLOT DATE: 6/13/02

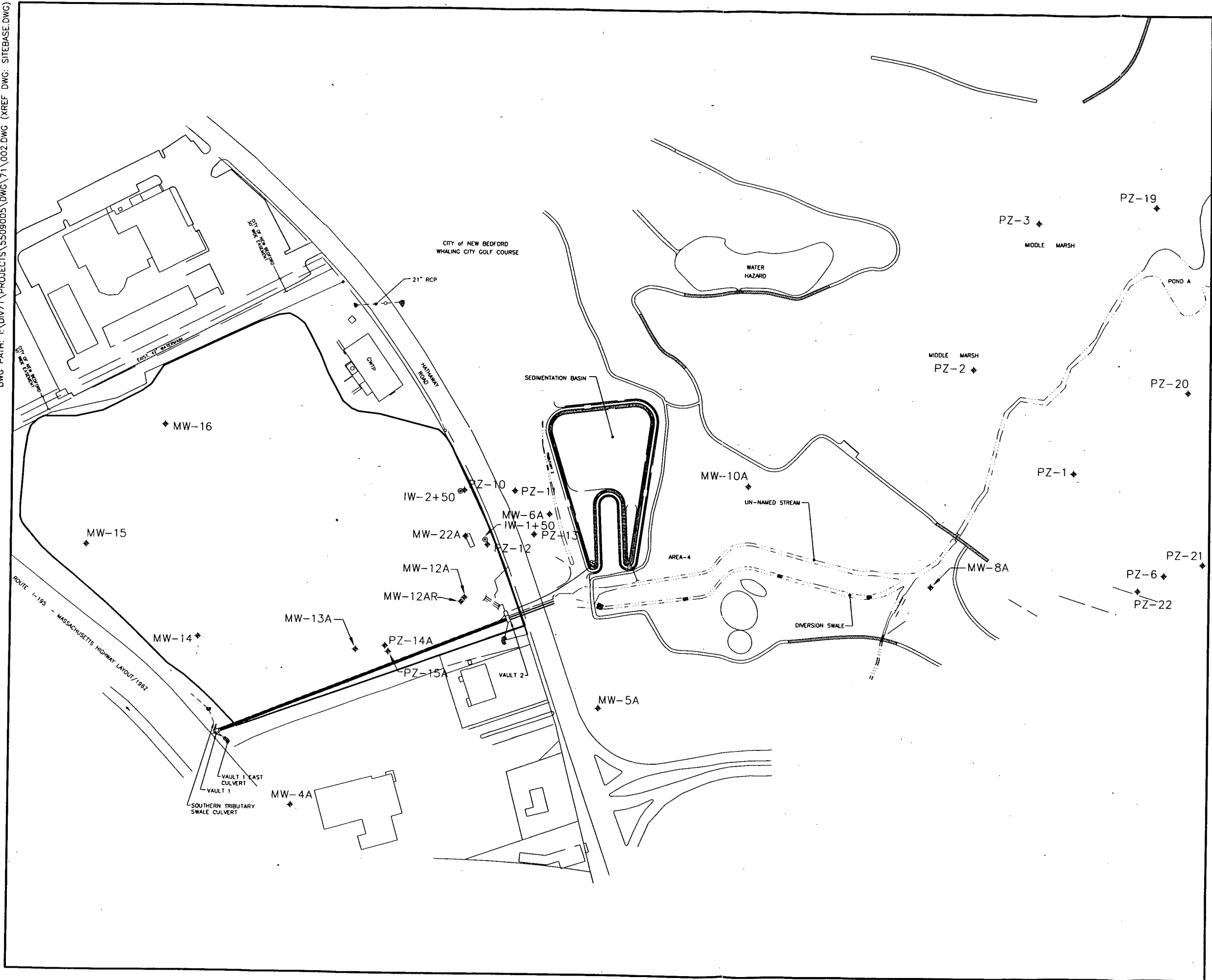


FIGURE-1



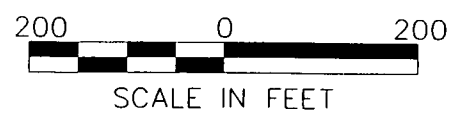
LEGEND

- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION

ELEVATIONS IN FEET  
RELATIVE TO MEAN SEA  
LEVEL

SULLIVAN'S LEDGE  
SUPERFUND SITE  
NEW BEDFORD, MASS.

OVERBURDEN WELL  
LOCATION MAP



FILE NO. 5509.005-002  
AUGUST 2001



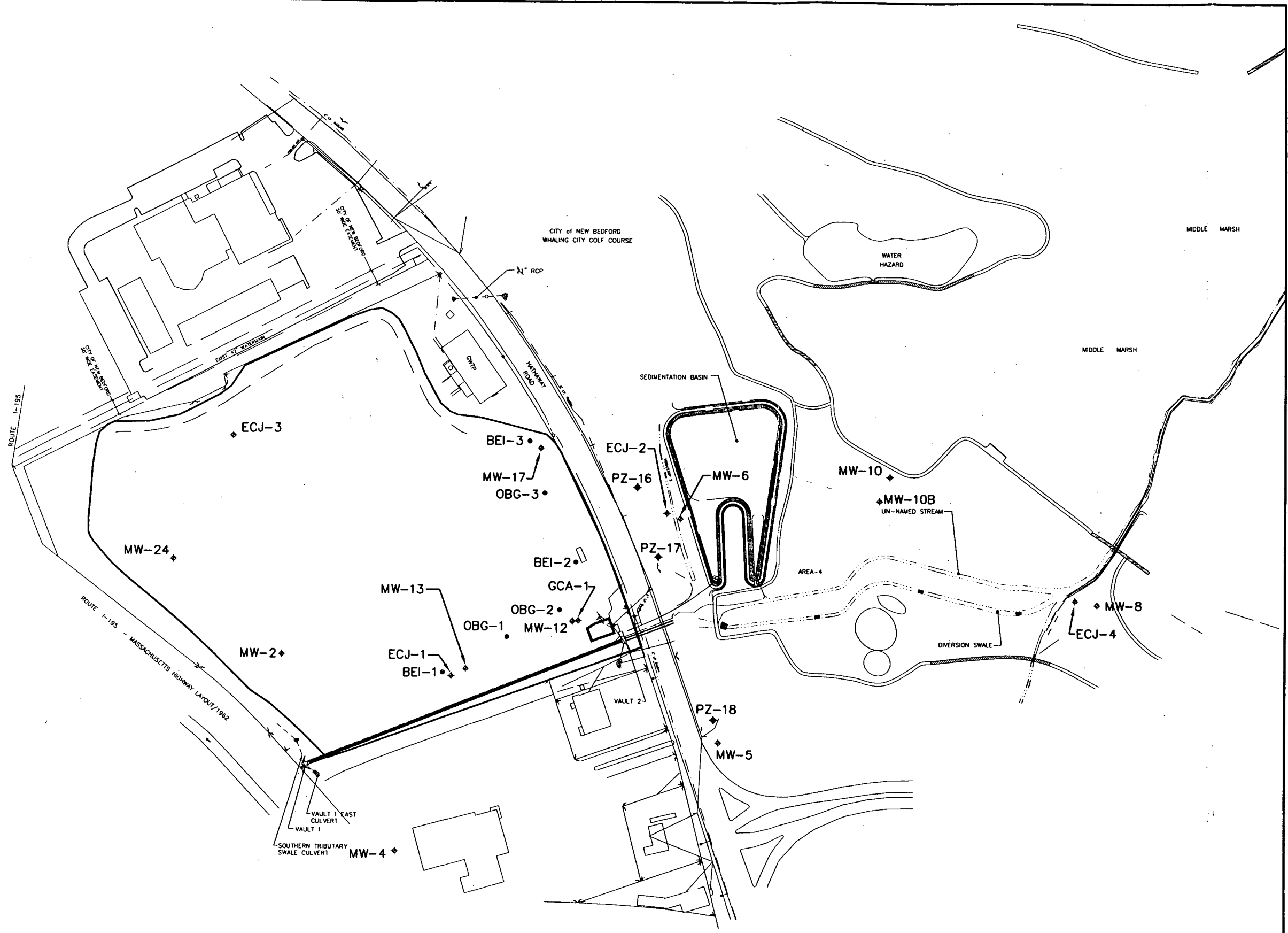


FIGURE-2



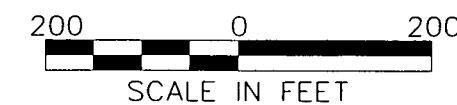
LEGEND

- ◆ MONITORING WELL LOCATION
- RECOVERY WELL LOCATION

ELEVATIONS IN FEET  
RELATIVE TO MEAN SEA  
LEVEL

SULLIVAN'S LEDGE  
SUPERFUND SITE  
NEW BEDFORD, MASS.

SHALLOW BEDROCK  
WELL LOCATION MAP



FILE NO. 5509.005-003  
AUGUST 2001



FIGURE-3



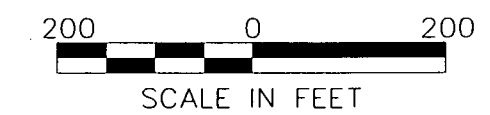
LEGEND

- ECJ WELL LOCATION
- RECOVERY WELL LOCATION

ELEVATIONS IN FEET  
RELATIVE TO MEAN SEA  
LEVEL

SULLIVAN'S LEDGE  
SUPERFUND SITE  
NEW BEDFORD, MASS.

INTERMEDIATE BEDROCK  
WELL LOCATION MAP



FILE NO. 5509.005-004  
AUGUST 2001

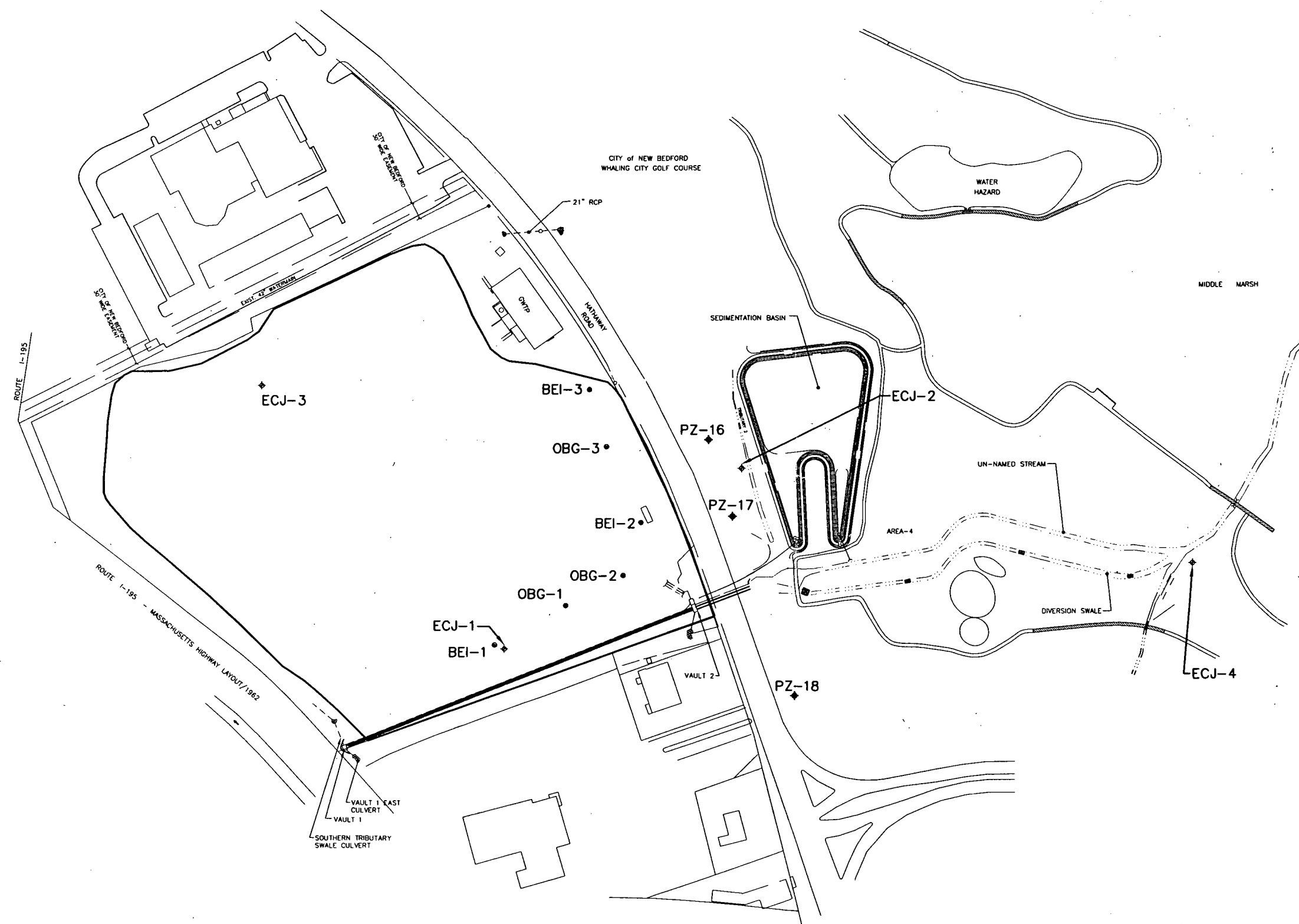


FIGURE-4



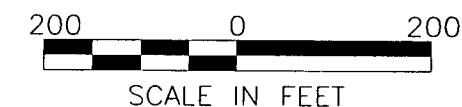
LEGEND

- ECJ WELL LOCATION
- RECOVERY WELL LOCATION

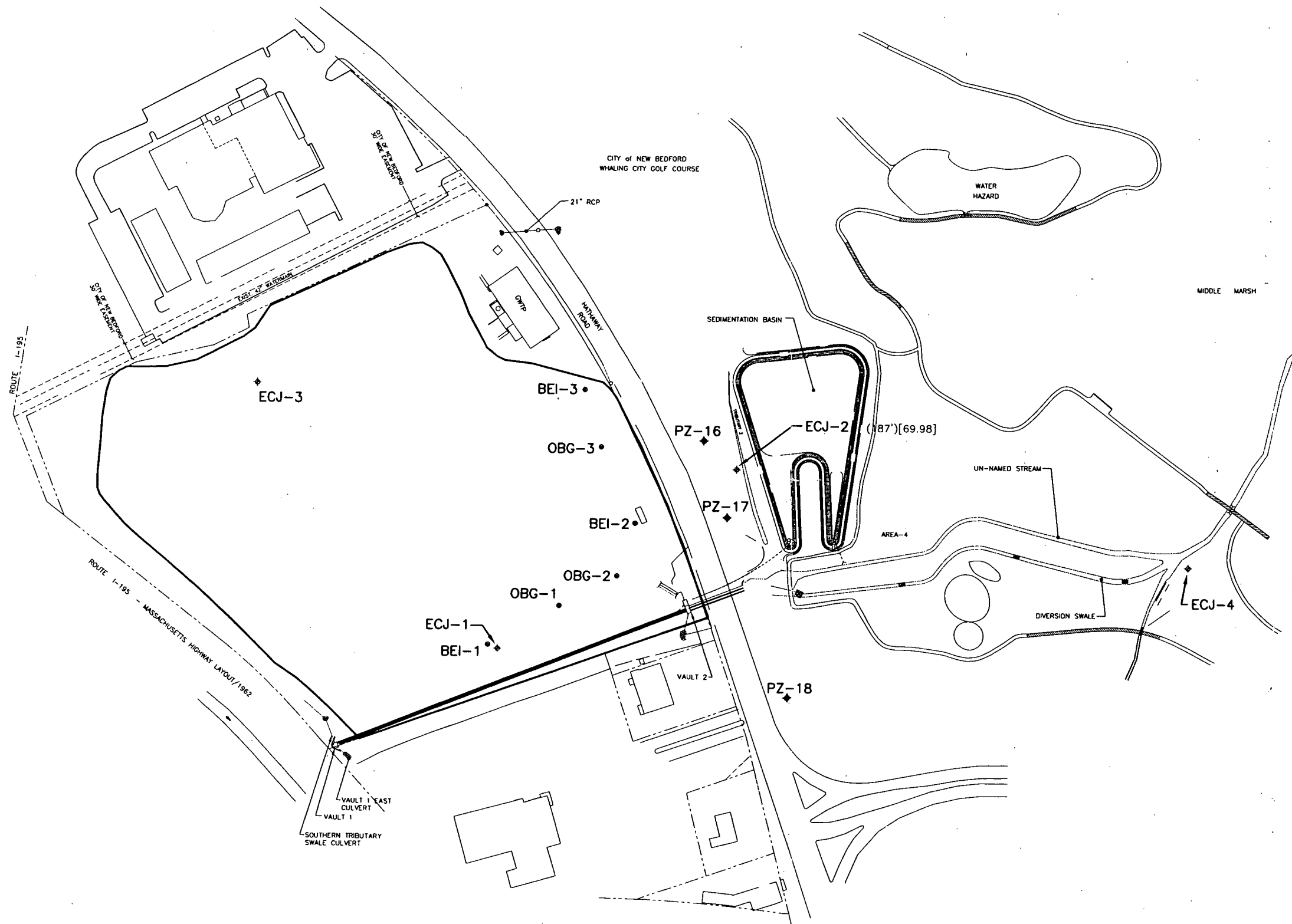
ELEVATIONS IN FEET RELATIVE TO MEAN SEA LEVEL

SULLIVAN'S LEDGE SUPERFUND SITE  
NEW BEDFORD, MASS.

DEEP BEDROCK WELL LOCATION MAP



FILE NO. 5509.005-005  
AUGUST 2001





## Appendix A

### Correspondence



March 14, 2001

Mr. David O. Lederer  
Remedial Project Manager  
Environmental Protection Agency (HBO)  
Region 1  
1 Congress Street, Suite 1100  
Boston, MA 02114-2023

Re: Sullivan's Ledge Superfund Site  
Spring 2001 Groundwater Sampling Event  
O'Brien & Gere Engineers, Inc.  
Syracuse, NY  
Project No. 20015.01

Dear Dave:

On behalf of O'Brien & Gere Engineers, Inc., this letter presents clarifications and modifications to the January 2000 Field Sampling Plan for the Spring 2001 groundwater sampling event at the Sullivan's Ledge Superfund Site, and is consistent with my e-mail to you dated February 26, 2001.

**Schedule:** The Spring 2001 sampling event is scheduled for the weeks of March 19 and March 26, 2001, consistent with O'Brien & Gere's letter to EPA dated June 26, 2000.

**Analytical Scope:** The analytical scope for the Spring 2001 round will consist of an annual round. Samples from conventional wells and Westbay well ports will be analyzed for VOCs, PCBs, SVOCs, and metals. The scope of the metals analysis will be increased from RCRA 8 metals to TAL metals. The modifications to the program recommended in O'Brien & Gere's June 26, 2000 letter will not be implemented.

**Filtering of Samples for Metals:** Samples will be collected for total metals analysis only. As we discussed, this approach is consistent with Massachusetts Contingency Plan Guidance. (See MCP Master Q&A 1993-1997 #Q164 "Water to be collected from a tap should not be filtered, nor should water collected with a low flow sampling pump that is designed to minimize turbidity...").

**Laboratory:** Laboratory analysis for the project will be completed by Alpha Analytical, Inc. (Alpha). On March 12, 2001, O'Brien & Gere forwarded to EPA Alpha's Laboratory Quality Assurance Manual, and a letter from Alpha dated March 7, 2001 which summarizes laboratory reporting limits and standard laboratory control limits.

**ECJ-3:** ECJ-3 is the upgradient Westbay well. This well was found plugged during the 1999/2000 sampling event. HLA has indicated that it has removed the blockages, but was unable to remove a 50-ft rod which had been used for clearing from the lower portion of the well (approximately 210 ft from top of casing). At a minimum, the rod will preclude sampling the lower two ports of the well. HLA has been requested to videotape the well, to evaluate well integrity and the potential for getting Westbay sampling equipment hung up in the well. Based on the above, ECJ-3 will not be sampled until the well is videotaped and found to be suitable for sampling. We will keep you apprised of the situation.

Project Organization: Samples will be collected by Mabbett & Associates, Inc. The overall project organization will be as follows:

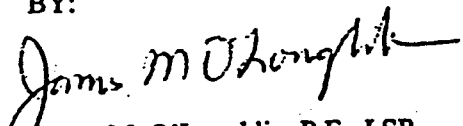
Title	Name	Firm
Project Coordinator:	James R. Heckathorne, PE	OBG
Project Manager:	James M. O'Loughlin, PE, LSP	M&A
Project Hydrogeologist:	Guy A. Swenson, CPG	OBG
Data Validator:	Melissa S. Listman	OBG
Site Manager:	Melissa A. Smith	M&A
Health & Safety Officer:	Gregory C. Guimond	M&A
Sampling Personnel:	Melissa A. Smith	M&A
	Gregory C. Guimond	M&A
	Darren J. Andrews	M&A
	Ryan E. Hill	M&A
	Theodore A. Nawn	M&A

We appreciated the opportunity to discuss the program with you on March 1, 2001, and look forward to completing it. Please contact Jim Heckathorne or me if we can provide any additional information.

Very truly yours,

MABBETT & ASSOCIATES, INC.

BY:

  
James M. O'Loughlin, P.E., LSP  
Senior Project Manager

JMO/tw

cc:	S. Wood	D. Allen	R. Carey	J. Johnson	J. Heckathorne
	E. Bertaut	D. Buckley		M. Wade	M. Listman
	R. Connors	D. Dwight			G. Swenson

DJA, GCG, REH, JMO, TAN, MAS, (MF/RF)

df: JEB, DAC, ANM, PDS



March 16, 2001

Mr. David O. Lederer  
Remedial Project Manager  
Environmental Protection Agency (HBO)  
Region 1  
1 Congress Street, Suite 1100  
Boston, MA 02114-2023

5 Alfred Circle  
Bedford, Massachusetts  
01730-2346  
Tel: (781) 275-6050  
Fax: (781) 275-5651  
info@mabbett.com  
www.mabbett.com

Re: Sullivan's Ledge Superfund Site  
Health and Safety Plan  
O'Brien & Gere Engineers, Inc.  
Syracuse, NY  
Project No. 20015.01

Dear Dave:

To complete the groundwater, landfill gas, and surface water/sediment sampling at Sullivan's Ledge, Mabbett & Associates, Inc. will be adopting the Health & Safety Plan developed by O'Brien & Gere for that purpose (provided to EPA on July 30, 1999). This plan was reviewed by M&A and found to be acceptable, subject to the following updates and clarifications:

Project Organization (Update to Section 1.4 and Table 1.1)

Title	Name	Telephone
Project Management Committee	Steven B. Wood	401-421-0398
Project Coordinator	James R. Heckathorne, PE	315-437-6100
Project Manager	James M. O'Loughlin, PE	781-275-6050
Technical Director of Environmental Health*	Ronald S. Ratney, Ph.D, CIH	781-275-6050
Site Health and Safety Coordinator	Gregory C. Guimond	781-275-6050
Field Team Leader	Melissa A. Smith	781-275-6050
Field Team Member	Darren J. Andrews	781-275-6050
Field Team Leader	Ryan E. Hill	781-275-6050
Field Team Member	Theodore A. Nawn	781-275-6050

\* Will assume duties delineated for Associate for Health and Safety

**Protective Equipment (Modification to Sections 2.2 and 4.2)**

Gloves: Nitrile inner gloves will be used in place of latex inner gloves.

Boots: For Level D, Modified Level D, and Modified Level C, footwear will consist of leather steel toe boots with rubber overboots. Because site soils have been remediated, and due to the slip hazard associated with mud and snow, disposable outerboots (i.e., tyvek booties) will not be worn.

Respirators: If the during groundwater sampling the concentration of VOCs in the breathing zone is 25 parts per million (ppm) above background, as measured by a PID, the well will be capped and the Project Manager will be contacted before upgrading to full face air purifying respirators with organic vapor cartridges.

**Emergency Telephone Numbers (Update to Table 9-1)**

Agency	Phone
Ambulance	911
St Lukes Hospital (General)	(508) 997-1515
St Lukes Hospital (Emergency Room)	(508) 961-5388
New Bedford Fire Department	(508) 991-6100
New Bedford Police Department	(508) 991-6340
New Bedford Public Works Department (Robert Carey, City Project Coordinator)	(508) 979-1527
Sullivan's Ledge Groundwater Treatment Plant	(508) 961-3160
U.S. Environmental Protection Agency (David Lederer, USEPA Project Manager)	(617) 918-1325
Massachusetts Department of Environmental Protection (Dorothy Allen, MADEP Project Manager)	(617) 292-5795
State Poison Center	(800) 682-9211
State Police	(617) 523-1212
State Emergency Response	(888) 304-1133
National Emergency Response	(800) 424-8802
Mabbett & Associates, Inc.	(800) 877-6050

**Map to Hospital (Update to Figure 9-1)**

An updated map to St Luke's hospital is attached.

**Personal Training (Modification to Section 3.2)**

Replace text in Section 3.2 with the following:

On-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations must have completed 40 hours of initial training, three days of supervised field experience, and at least 8 additional hours of specialized training.

**Medical Surveillance Program (Modification to Section 5.1)**

Replace text in Section 5.1 with the following:

All employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year; who wear a respirator for 30 days or more a year; or are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation are subject to the medical surveillance requirements outlined herein.

Medical examinations and consultations shall be made available by the employer to each employee prior to assignment; at least once every twelve months for each employee covered unless the attending physician believes a longer interval (not greater than biennially) is appropriate; at termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months; as soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards, or that the employee has been injured or exposed above the permissible exposure limits or published exposure levels in an emergency situation; or at more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.

For employees who may have been injured, received a health impairment, developed signs or symptoms which may have resulted from exposure to hazardous substances resulting from an emergency incident, or exposed during an emergency incident to hazardous substances at concentrations above the permissible exposure limits or the published exposure levels without the necessary personal protective equipment being used, medical examinations and consultations shall be made available as soon as possible following the emergency incident or development of signs or symptoms and at additional times, if the examining physician determines that follow-up examinations or consultations are medically necessary.

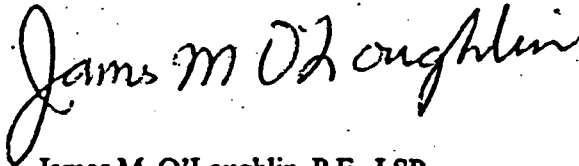
Please contact the undersigned if you have any comments or if we can provide any further information.

Mr. David O. Lederer  
March 16, 2001  
Page 4 of 4

Very truly yours,

MABBETT & ASSOCIATES, INC.

BY:



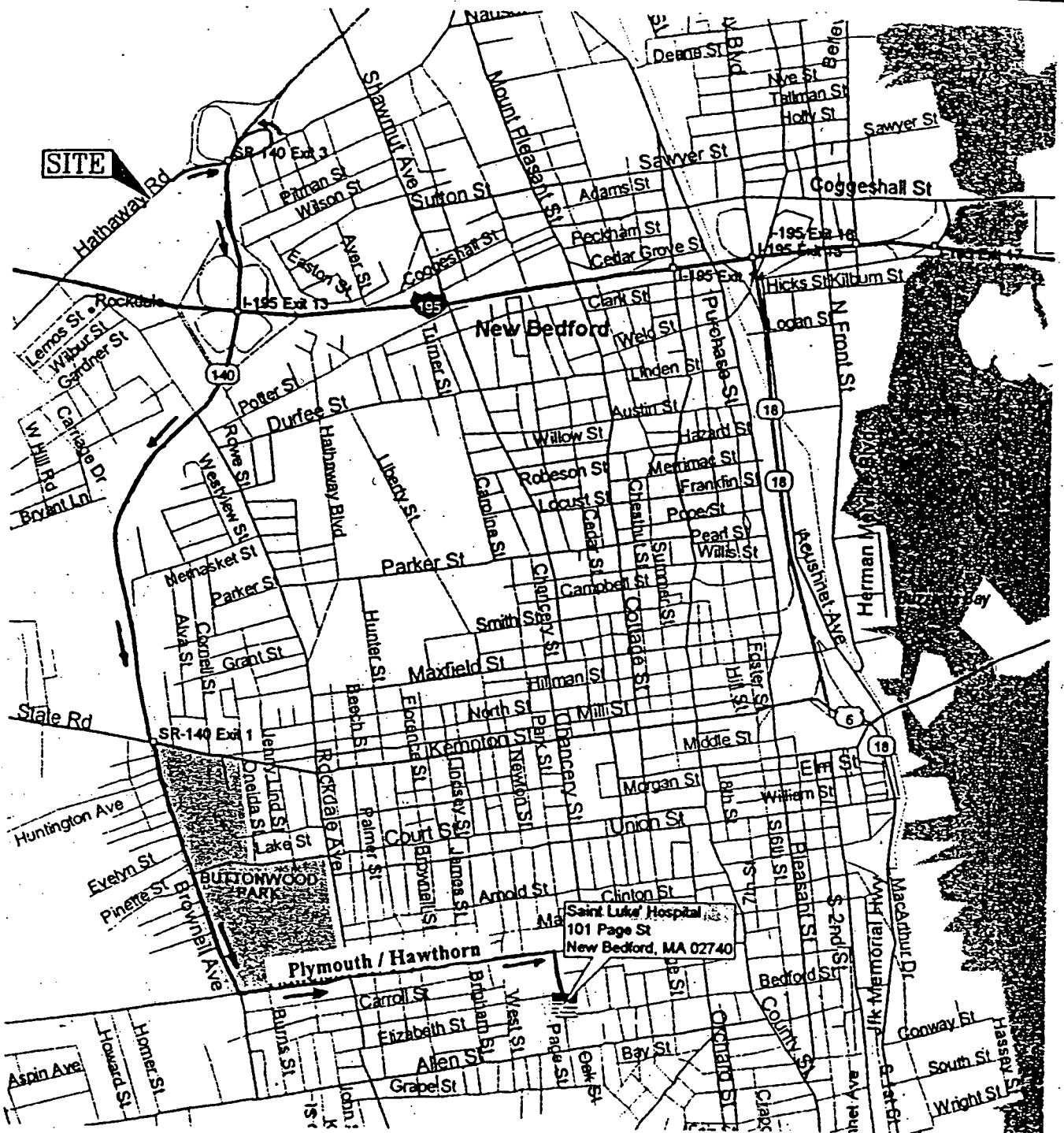
James M. O'Loughlin, P.E., LSP  
Senior Project Manager

JMO/tw

cc: S. Wood D. Allen R. Carey J. Heckathorne  
E. Bertaut D. Buckley  
R. Connors D. Dwight

DJA, GCG, REH, JMO, TAN, RSR, MAS, (MF/RF)

df: JEB, DAC, ANM, PDS



# **Directions to Saint Luke's Hospital, 101 Page Street, New Bedford, Ma.**

Take Route 140 south. Continue straight onto Brownall Avenue, at the 140/Route 6 intersection. Turn left after Buttonwood Park, onto Plymouth. Follow Plymouth for approximately 0.9 miles to Page Street. Turn right onto Page St., and travel 1 1/2 blocks to Saint Luke's Hospital (on your right). The route described also has signs to assist in locating Saint Luke's Hospital.

## **SULLIVAN'S LEDGE**

NEW BEDFORD, MASSACHUSETTS



Mabbett & Associates, Inc.  
Environmental Consultants & Engineers

## **SAINT LUKE'S HOSPITAL DIRECTION MAP**

SCALE: AS NOTED

DR BY: DJA

DATE: 3/15/01

AP BY: JMD

DWG NO.

M-1

PROJ NO.

20015.07

February 11, 2002

VIA OVERNIGHT DELIVERY

Mr. David O. Lederer  
Remedial Project Manager  
Environmental Protection Agency (HBO)  
Region 1  
1 Congress Street, Suite 1100  
Boston, MA 02114-2023

Re: Sullivan's Ledge Superfund Site  
2002 Ground Water Monitoring Program

File: 5509.005 #2

Dear Dave:

On behalf of the Sullivan's Ledge Site Group, and consistent with past discussions, O'Brien & Gere is submitting the following proposed sampling plan for the 2002 Groundwater Monitoring Program at the Sullivan's Ledge Superfund Site, which represents a revision of the 2001 program, and is based upon a review of the data from the 2001 program and the substantial data from past groundwater sampling programs at the site.

Paragraph V.C.2. of the Statement of Work (SOW) describes requirements for compliance groundwater monitoring. A baseline round of groundwater monitoring was conducted at the site in the winter of 1999 / 2000, to coincide with the start-up of the groundwater treatment plant. Rounds of groundwater sampling were also conducted in Spring 2001, Summer 2001, Fall 2001, and Winter 2001. Based on these and previous rounds of sampling, as well as data obtained during groundwater treatment plant start-up and operation, O'Brien & Gere is writing this letter to propose a revised groundwater sampling plan for three quarterly events beginning in March 2002 and the annual sampling event. This request is consistent with Paragraph V.C.2.h of the SOW, which states:

*"On its own initiative or at the request of Settling Defendants, EPA, in consultation with DEP, may add or delete specific parameters, monitoring wells, or zones and may adjust monitoring frequencies and requirements for water level measurements, depending on sample results and observed trends."*

The proposed plan and rationale are presented in Attachment A. Elements of the proposed plan were discussed with EPA on May 12, 2000 and June 17, 2001, and have been presented in letters dated June 26, 2000 and May 18, 2001. In general, during the annual sampling event, 43 monitoring wells and 7 recovery points will be sampled for VOCs, PCBS, and 8 metals of environmental significance. In addition, during the annual sampling event, a composite influent sample to the GWTP will be sampled for SVOCs. During the quarterly events, a total of 17 monitoring wells and 7 recovery points will be sampled. The monitoring wells will be sampled for VOCs (24 locations) and PCBs (5 locations). The 7 recovery points will be sampled for VOCs, PCBs, and 8 metals of environmental significance.



Mr. David O. Lederer  
February 11, 2002  
Page 2

The following schedule is proposed for the program:

Quarterly Event	March 11 – 22, 2002
Quarterly Event	June 10 – 21, 2002
Quarterly Event	September 9 – 20, 2002
Annual Event	December 2 – 13, 2002

The events generally coincide with a quarterly schedule, with some allowance for holidays and winter. The annual event is scheduled for winter, consistent with the 1999 / 2000 baseline sampling event and the Winter 2001 sampling event, to facilitate historical comparisons.

Please contact me if you have any questions concerning this letter.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC

James R. Heckathorne, PE  
Vice President

I:\DIV71\Projects\5509005\2\_correspondence\LEDER06.doc  
Attachment

cc: S. Wood E. Vaughan J. O'Loughlin  
E. Bertaut D. Dwight G. Swenson  
R. Connors

**Sullivan's Ledge Superfund Site  
2002 Groundwater Sampling Program  
Attachment A**

**I. MONITORING WELLS**

**A. 2002 Annual Sampling Event**

**1. Overview**

Table 1 presents monitoring wells and recovery systems to be sampled during the 2002 annual sampling event. The locations of these monitoring wells and recovery systems are shown on Figure 1. The program is discussed in greater detail below.

**2. Overburden Monitoring Wells**

As shown on Table 1, and consistent with the Statement of Work (SOW), all overburden monitoring wells will be sampled during the annual sampling event.

**3. Bedrock Monitoring Wells**

As shown on Table 1, and consistent with the Statement of Work (SOW), all bedrock monitoring wells will be sampled during the annual sampling event.

**4. Westbay Multi-port Bedrock Monitoring Wells**

As shown on Table 1, and consistent with the Statement of Work (SOW), all Westbay monitoring ports will be sampled during the annual sampling event.

**5. Recovery Systems**

As shown on Table 1, the six bedrock recovery wells and the shallow collection trench will be sampled during the annual sampling event.

**6. Summary**

Consistent with the Statement of Work, a total of 43 monitoring wells and 7 recovery points will be sampled during the 2002 annual sampling event.

**B. 2002 Quarterly Sampling Events**

**1. Overview**

Table 2 presents monitoring wells and recovery systems to be sampled during the 2002 quarterly sampling events. The locations of these monitoring wells and recovery systems are shown on Figure 2. The program is discussed in greater detail below.

**2. Overburden Monitoring Wells**

The SOW indicates that after the first four consecutive quarters, sampling of overburden monitoring wells shall be conducted annually. Although not required by the SOW, it is proposed that MW-6A, MW-14, and MW-15 be sampled during the quarterly events in 2002. As shown on Figure 2, MW-6A is immediately across Hathaway Road from the Disposal

**Sullivan's Ledge Superfund Site  
2002 Groundwater Sampling Program  
Attachment A**

**3. Metals**

As shown on Table 1, and consistent with the SOW, during the annual program, all overburden wells, bedrock wells, Westbay wells, and recovery points will be analyzed for metals. Paragraph II.C.4, below, describes proposed analytical methods as well as the 8 metals proposed for analysis.

**4. SVOCs**

As described in Section V.C.2. of the 1990 SOW, ground water sampling for Semi-Volatile Organic Compounds (SVOCs) is to be performed annually in overburden wells and bedrock wells after the first year. However, data collected since 1990 indicates that this approach is overly conservative and will result in the generation of data that has little use. Specifically:

- As discussed in the EPA-approved Preliminary Design Report, SVOCs have historically been detected in site ground water infrequently and in relatively low concentrations. From 1985 to 1993, fifty-one wells were sampled for SVOCs on multiple occasions, and of those wells sampled, results indicated that only five compounds were detected above CLP contract required quantitation limits (CRQLs) in more than 5% of the samples. Also, SVOCs were detected in areas where locally higher VOC concentrations were detected.
- Results for SVOCs from the 1999 / 2000 baseline sampling event and the Spring 2001 sampling event are consistent with the results from previous rounds of sampling. As shown in Table 4, SVOCs from the 1999 / 2000 baseline sampling event and Spring 2001 sampling event continue to make-up only a small fraction of the total organic compound concentrations detected in monitoring wells.
- The six bedrock recovery wells and the shallow groundwater collection trench were sampled for SVOCs twice during GWTP start-up, and twice during post start-up operation, as shown on Table 5. Data from the four rounds of GWTP influent monitoring indicate a total SVOC concentration ranging from non-detect to 371 ug/L, well below New Bedford pretreatment standards. As shown on Table 5, SVOCs make up a small fraction of the total organic loading to the GWTP. The concentrations of SVOCs at the recovery points have also been remarkably consistent over time.
- As shown on Table 6, sample results for SVOCs in the effluent from the GWTP between the period December 1999 and December 2001 have been non-detect for 20 of the 36 samples collected. Fifteen of the sixteen detections ranged from 0.001 mg/l to 0.033 mg/l, and averaged 0.013 mg/l, and were at least two orders of magnitude below the Total Toxic Organic (TTO) discharge limitation of 2.0 mg/l. Even the anomalously high result of 0.150 mg/l in March 2001 was over an order of magnitude below the TTO discharge limitation of 2.0 mg/L.

Although analysis for SVOCs is not proposed for samples from monitoring wells, as a conservative approach, a composite influent sample at the GWTP will be analyzed for SVOCs during the 2002 annual event. As shown on Table 5, the concentrations of total SVOCs in the seven individual sources do not vary significantly, ranging from ND - 13.1

**Sullivan's Ledge Superfund Site  
2002 Groundwater Sampling Program  
Attachment A**

ug/l in BEI-3, to ND – 73 ug/l in the shallow collection trench, to 26 - 371 ug/l in OBG-2. A composite sample will provide adequate data to confirm that SVOCs make up a small fraction of the organic loading to the groundwater treatment plant. Paragraph II.C.5, below, describes proposed the proposed method to be used for SVOC analysis.

**5. Summary**

During the 2002 annual sampling event, and consistent with the SOW, groundwater samples from 43 monitoring points and 7 recovery points will be analyzed for VOCs, PCBs, and metals. In addition, a composite influent sample at the GWTP will be analyzed for SVOCs during the annual event.

**B. Quarterly Program**

**1. VOCs**

As shown on Table 2, all overburden wells, bedrock wells, Westbay wells, and recovery points selected for sampling will be sampled for VOCs during the quarterly events. Paragraph II.C.2, below, describes the proposed analytical method and constituents to be reported.

**2. PCBs**

As shown on Table 2, all recovery points will be sampled for PCBs during the annual events. In addition, during the quarterly events, the following overburden and bedrock wells will be sampled for PCBs: MW-14, MW-15, MW-24, MW-2, and MW-6A. As shown on Table 3, these are the only wells on the site periphery which exhibited detections of PCBs during the 1999 baseline sampling event or the four consecutive quarterly rounds conducted in 2001. Paragraph II.C.3, below, describes the proposed method to be used for PCB analysis.

As shown on Table 2, a several wells on the Disposal Area, which will be sampled for VOCs during the quarterly events, are not proposed for PCB analysis. These wells include GCA-1 and ECJ-1. Examination of Table 3 indicates that for a collective total of 32 samples from these wells over the last 5 sampling events, 20 have been non-detect for PCBs. As shown on Table 3, when detected, the concentrations of PCBs in these wells are typically many orders of magnitude lower than the concentration of VOCs. Moreover, when detected in these wells, PCB concentrations have been remarkably consistent (e.g., GCA-1, ECJ-1 (37)). As shown on Figure 1, GCA-1 and ECJ-1 are all on the Disposal Area, and up-gradient of groundwater recovery equipment. These wells are proposed for quarterly monitoring for VOCs and annual monitoring for PCBs. Repeated sampling of these wells for PCBs during the quarterly events will provide data of little or no value.

Similarly, as shown on Table 2, several wells outside the Disposal Area, which will be sampled for VOCs during the quarterly events, are not proposed for PCB analysis. These wells include MW-6 and ECJ-2. Since the baseline round in 1999, there have been a collective total of 27 samples from these wells – and PCBs have not been detected. These wells are proposed for quarterly monitoring for VOCs and annual monitoring for PCBs. Repeated sampling of these wells for PCBs during the quarterly events will provide data of little or no value.

**Sullivan's Ledge Superfund Site  
2002 Groundwater Sampling Program  
Attachment A**

**3. Metals**

As shown on Table 2, all recovery points will be sampled for metals during the quarterly events. Paragraph II.C.4, below, describes proposed analytical methods as well as the 8 metals proposed for analysis. Consistent with the SOW, overburden wells, bedrock wells, and Westbay wells will not be sampled for metals during the quarterly events.

**4. SVOCs**

Consistent with the SOW, overburden wells, bedrock wells, and Westbay wells will not be sampled for SVOCs during the quarterly events.

**5. Summary**

Consistent with the SOW, samples from all of the monitoring wells sampled during the quarterly events will be analyzed for VOCs. A total of 17 monitoring wells will be sampled. In addition, samples from 5 monitoring wells on the site periphery which have exhibited detections of PCBs will be analyzed for PCBs during the quarterly events. Finally, samples from 7 recovery points will be analyzed for VOCs, PCBs, and 8 metals during the quarterly events.

**C. Analytical Methods and Parameters**

**1. Overview**

The same analytical methods for VOCs, PCBs, metals, and SVOCs are proposed for the 2002 groundwater sampling program as were used during the 2001 program. However, in an effort to streamline data validation and management, it is proposed that the laboratory analyze for and report the results of all method 8260 B compounds, but that only the 13 compounds that have been detected at the site with a reasonable degree of consistency and frequency be validated and presented in the reports. Similarly, it is also proposed that analysis for metals be reduced from the full suite of 23 TAL metals to 8 metals of potential environmental significance that have been detected at the site with a reasonable degree of consistency and frequency. Details concerning the proposed analytical program are presented below.

Sullivan's Ledge Superfund Site  
2002 Groundwater Sampling Program  
Attachment A

2. VOCs

Consistent with the 2001 groundwater sampling program, VOCs will be analyzed by method 8260B. However, as discussed above, based on historical data as well as the results from the 1999 / 2000 baseline round and the four consecutive quarters of data in 2001, it is proposed that the list of VOCs to be validated and presented in the reports be limited to those constituents that have been frequently and consistently observed on-site. Specifically, it is proposed that the following constituents be validated and presented:

trichloroethene <sup>(1) (2)</sup>	benzene <sup>(1) (2)</sup>	xylene (ortho) <sup>(1)</sup>
1,2 dichloroethene (cis) <sup>(1) (2)</sup>	toluene <sup>(1)</sup>	1,4 dichlorobenzene
1,2 dichloroethene (trans) <sup>(1) (2)</sup>	ethyl benzene	naphthalene
vinyl chloride <sup>(1) (2)</sup>	xylene (meta) <sup>(1)</sup>	
chlorobenzene <sup>(1)</sup>	xylene (para) <sup>(1)</sup>	

The basis for this list and an explanation of the superscripted notes are presented below.

As shown on Tables 7-1, 7-2, 7-3, and 7-4, the VOCs listed in the first two columns were the only VOCs detected in more than 10% of the samples during any one of the four sampling events. Three other constituents (ortho-xylene, naphthalene, and 1,4 dichloro-benzene) were detected in just under 10% of the samples, and are included with the list as a conservative approach. As shown on Tables 8-1, 8-2, and 8-3, the above constituents have also been the more frequently detected constituents in the influent samples from the groundwater treatment plant.

It should be noted that the above list is more comprehensive than the list of VOC compounds selected as indicator parameters in the 1993 Ground Water Trend Analysis Report (i.e., benzene, toluene, xylene, chlorobenzene, trichloroethene, 1,2 dichloroethene, and vinyl chloride). These compounds are designated by note (1) in the table above. The remedial design was based on this small subset of indicator parameters. It should also be noted that the 1989 RI Report indicated that an even smaller subset of constituents (i.e., vinyl chloride, trichloroethylene, 1,2-dichloroethene, benzene, and PCBs) represent over 99 percent of the total carcinogenic or non-carcinogenic baseline risks to human health associated with groundwater. These compounds are designated by note (2) above.

A total of 74 VOC compounds were validated and presented in the reports in 2001. Tables 7-1, 7-2, 7-3, and 7-4 indicate that no more than 27 VOC compounds were detected at over 40 monitoring wells during the four consecutive rounds of sampling conducted in 2001. To continuously validate, present, and manage data pertaining to approximately 47 compounds which have never been detected, and another 14 which are only detected in no more than 7% of the samples, is an inappropriate use of resources. The focused approach presented above will provide data which is just as meaningful for site management purposes, and which is much easier to comprehend and use.

3. PCBs

Consistent with the 2001 groundwater sampling program, PCBs will be analyzed by method 8082.

**Sullivan's Ledge Superfund Site  
2002 Groundwater Sampling Program  
Attachment A**

treatment plant start-up, and the concentration of metals in the influent have consistently been well below City of New Bedford pretreatment requirements.

5. SVOCs

Consistent with the 2001 groundwater sampling program, SVOCs will be analyzed by method 8270C.

**Table 2**  
**Sullivan's Ledge Superfund Site**  
**2002 Groundwater Sampling Program**  
**Quarterly Events <sup>(1)</sup>**

Sampling Point	Set	Analysis			
		VOCs <sup>(2)</sup>	PCBs	Metals <sup>(3)</sup>	SVOCs
Overburden Monitoring Wells - Inside Disposal Area					
MW-12A	A				
MW-13A	A				
MW-22A	A				
MW-14	B	X	X		
MW-15	B	X	X		
MW-16	B				
Overburden Monitoring Wells - Outside Disposal Area					
MW-04A	C				
MW-05A	C				
MW-06A	C	X	X		
MW-08A	D				
MW-10A	D				
Bedrock Monitoring Wells - Inside Disposal Area					
GCA-1	A	X			
MW-13	A				
MW-17	A				
MW-24	B	X	X		
MW-02	B	X	X		
Bedrock Monitoring Wells - Outside Disposal Area					
MW-04	C				
MW-05	C				
MW-06	C	X			
MW-08	D				
MW-10	D				
MW-10B	D				
Westbay Multiport Bedrock Monitoring Wells					
ECJ 1 - 37	A	X			
ECJ 1 - 62	A	X			
ECJ 1 - 72	A	X			
ECJ 1 - 122	A	X			
ECJ 1 - 148	A	X			
ECJ 1 - 267	A				
ECJ 2 - 47	C	X			
ECJ 2 - 82	C	X			
ECJ 2 - 117	C	X			
ECJ 2 - 152	C	X			
ECJ 2 - 187	C	X			
ECJ 3 - 51	B				
ECJ 3 - 91	B				
ECJ 3 - 126	B				
ECJ 3 - 146	B				
ECJ 4 - 62	D				
ECJ 4 - 87	D				
ECJ 4 - 132	D				
ECJ 4 - 162	D				
ECJ 4 - 227	D				
ECJ 4 - 245	D				
Groundwater Recovery Systems					
Shallow Collection Trench		X	X	X	
Bedrock Recovery Wells					
BEJ - 1		X	X	X	
BEJ - 2		X	X	X	
BEJ - 3		X	X	X	
OBG - 1		X	X	X	
OBG - 2		X	X	X	
OBG - 3		X	X	X	
GWTP Composite					
Summary					
Total Samples		24	12	7	0
QA/QC		2	1	1	0
Duplicate		2	1	1	0
MS		1	1	1	0
MSD		1	1	1	0
Total		30	16	11	0
Analytical Methods					
VOCs SW5030/SW8260B		Total Metals	SW3010/6010B/7470A		
PCBs SW8260/SW8082		SVOCs	SW3520/SW8270C		
Notes					
(1) = Proposed for March 2002, June 2002, and September 2002					
(2) = TCE, 1,2-DCE (cis and trans), vinyl chloride, chlorobenzene, benzene, toluene, ethyl benzene, xylene (o,m,p), 1,4-dichlorobenzene, and naphthalene.					
(3) = Aluminum, barium, chromium, copper, iron, lead, vanadium, and zinc					



From: "Steve Wood" <swood@essgroup.com>  
To: "Dave Lederer (E-mail)" <LEDERER.DAVE@epamail.epa.gov>, "Evelina Vaughn (E-mail)" <evelina.vaughn@state.ma.us>  
Date: 3/22/02 2:22PM  
Subject: First quarter 2002 GW sampling

Dave - This e-mail is to acknowledge receipt of M&E comments you forwarded with your letter of March 10, 2002 and comments from DEP on the first quarter 2002 ground water sampling round. We have reviewed the comments and note that most pertain to the annual round of sampling which we will address at a later date, as they do not effect this quarterly round. We will modify the sampling plan to add MW-4 as suggested by DEP and analyze for the selected VOCs. With respect to sampling for select VOC's and 8 metals in this round, we note the comments and agree that sampling for total VOC's during the annual round has some merit. However, we do not agree that it is necessary to sample all 23 metals and all VOC's during this quarterly round.

Therefore, we plan to go forward with the sampling program as proposed, with the addition of MW-4

Sampling was originally scheduled for the week of March 11, 2002 but was delayed to allow us time to review the comments. We have rescheduled the sampling to begin on March 26, 2002 and it should continue through the week and possibly continued on the following Monday.

Please feel free to call if you have any comments or questions.

Steve

Steve Wood  
Senior Project Manager  
Environmental Science Services, Inc.  
(401) 421-0398 ext. 130  
(401) 421-5731 Fax  
(401) 374-0515 Mobile  
swood@essgroup.com

CC: "Jim Heckathorne (E-mail)" <HeckatJR@obg.com>

**Conventional Low-flow Ground  
Water Sampling Logs, Instrument  
Calibration Logs, Chain-of-  
Custodies, Ground Water Elevation  
Data Tables**

Date	3/19/03	Personnel	CLM/JAP	Weather	Sunny - 40's
Site Name	Sullivan's Hedge	Evacuation Method	Bladder Pump	Well #	GCA-1
Site Location	New Bedford	Sampling Method	Low Flow	Project #	2000015-009
Well information:					

Depth of Well *		ft.
Depth to Water *	<u>13.72</u>	ft.
Length of Water Column		ft.


Top of Well Casing  
Top of Protective Casing  
(Other, Specify)

[illegible]

3 gallons

Sheen/Free Product None

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
40ml	Vial	6	N	HCl	Vol's
Litre	Amber	6	N	None	Pres.

76/780 also collected here

Low Flow Ground Water Sampling Log					
Date	3/18/03	Personnel	AAO/TAD	Weather	SUNNY - 48°F
Site Name	SULLIVAN'S LEAKE	Evacuation Method	BLADDER PUMP	Well #	MW-2
Site Location	NEW BEDFORD, MA	Sampling Method	Art Flow	Project #	2000015.009
Well information:					

Depth of Well *		ft.
Depth to Water *	<u>15.85</u>	ft.
Length of Water Column		ft.

	Top of Well Casing
✓	Top of Protective Casing
	(Other, Specify)

[illegible]

2.5 GAL

Color clear  
Odor none  
Product none

Color clear  
Odor none  
Product none

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container - pesticide Analysis
40ml	Vial	2	N	HCL	VOCS
1 litre	Amber	2	N	None	PCBS

April 25, 1997

Date <u>3/18/02</u>				
Site Name	<u>Sullivan's ledge</u>	Personnel	<u>CLM/JAD</u>	Weather <u>Sunny, 50's</u>
Site Location	<u>New Bedford</u>	Evacuation Method	<u>Bladder Pump</u>	Well # <u>MW-4</u>
		Sampling Method	<u>Low Flow</u>	Project # <u>2000015-1009</u>
Well information:				

Depth of Well \* 8.23 ft.  
Depth to Water \* \_\_\_\_\_ ft.  
Length of Water Column \_\_\_\_\_ ft.

Top of Well Casing  
Top of Protective Casing  
(Other, Specify)

[illegible]

1 Gallon

Sheen/Free Product

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
100ml 1 litre	Vial Amber	2 2	N N	HCL None	VOC's PCB's

April 25, 1997  
Form developed by

# Low Flow Ground Water Sampling Log

Date 3/17/03 Personnel JAD/AAA Weather Sunny, 50°F  
 Site Name Sullivan's Hedge Evacuation Method Bladder Pump Well # NW-06  
 Site Location New Bedford Sampling Method Low Flow Project # 2000015.009

## Well information:

Depth of Well \* 5.12 ft.  
 Depth to Water \* 5.12 ft.  
 Length of Water Column 5.12 ft.

\* Measurements taken from

☒ Top of Well Casing  
☐ Top of Protective Casing  
 (Other, Specify)

Water parameters: Lower submersible pump slowly through stagnant water column  
 Position pump in center of screened interval & maximum pumping rate of 0.5 liters/minute  
 Collect readings at every three minute intervals

Checked Catib  
 10 = 9.96 → 10

Elapsed Time	Depth To Water	Temperature	pH	Conductivity	Oxidation Reduction Potential	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (ml/min).
0	5.18	13.48	5.08	1201	-102.5	10.05	0.00	225
5	5.20	12.92	3.74	1203	-98.3	6.87	0.0	225
10	5.20	12.84	3.39	1215	-94.8	11.55	0.0	225
15	5.20	12.73	3.12	1212	-93.5	5.98	0.0	225
20	5.20	13.94	3.12	1215	-93.9	7.07	0.0	225
25	5.20	13.20	3.01	1214	-98.3	4.47	0.0	225
30	5.20	12.29	2.45	1204	-83.5	5.91	0.0	225
35	5.20	12.16	2.26	1195	-76.0	8.07	0.0	225
40	5.20	12.14	2.13	1191	-67.3	5.92	0.0	225
45	5.20	12.18	2.09	1179	-55.0	6.50	0.0	225
50	5.20	12.15	1.87	1176	-40.5	6.61	0.0	226
55	5.20	12.20	1.73	1168	-29.5	7.05	0.0	225
60	5.20	12.21	1.67	1159	-18.4	5.08	0.0	225
65	5.20	12.22	1.62	1149	-9.5	6.47	0.0	225
70	5.20	12.18	1.59	1144	-1.7	6.19	0.0	225
75	5.20	12.15	1.59	1143	-0.9	6.28	0.0	225
80	5.20	12.17	1.57	1143	-0.1	6.61	0.0	225
85								
90								

## Water sample:

Time collected: 12:45

Total volume of purged water removed:

3G

Physical appearance at start

Color clear  
 Odor none

Physical appearance at sampling

Color clear  
 Odor none  
 Sheen/Free Product none

Sheen/Free Product

Sheen/Free Product

## Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
<u>40ml</u>	<u>Vial</u>	<u>2</u>	<u>N</u>	<u>HCL</u>	<u>VOC's</u>

Notes:

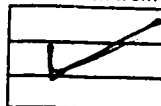
# Low Flow Ground Water Sampling Log

Date 3/17/03 Personnel JAD Weather Sunny, 50's  
 Site Name Sullivan's Lodge Evacuation Method Bladder Pump Well # MW-6A  
 Site Location New Bedford Sampling Method Low Flow Project # 2000015-009

## Well information:

Depth of Well \*                      ft.  
 Depth to Water \* 5.50 ft.  
 Length of Water Column                      ft.

\* Measurements taken from



Top of Well Casing  
 Top of Protective Casing  
 (Other, Specify)

PAGE  
1 OF 1

## Water parameters:

Lower submersible pump slowly through stagnant water column  
 Position pump in center of screened interval & maximum pumping rate of 0.5 liters/minute  
 Collect readings at every three minute intervals

Elapsed Time	Depth To Water	Temperature	pH	Conductivity	Oxidation Reduction Potential	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (ml/min).
0	5.65	9.36	3.63	1150	-11.0	1.67	33.0	250
5	5.65	9.23	2.74	1150	62.8	2.75	14.0	250
10	5.65	9.31	2.57	1143	95.6	2.56	4.39	250
15	5.65	10.17	2.64	1144	120.8	2.66	4.84	150
20	5.65	10.96	2.88	1146	133.5	2.89	4.42	150
25	5.65	11.25	2.99	1162	146.4	4.38	4.51	150
30	5.65	11.59	3.00	1159	160.2	3.99	11.1	150
35	5.65	11.65	3.02	1154	166.5	3.82	10.8	150
40	5.65	12.01	3.06	1153	171.1	3.66	15.0	150
45	5.65	12.33	3.09	1153	189.5	2.97	14.2	150
50	5.65	11.34	2.89	1156	200.5	2.88	13.0	150
55	5.65	11.20	2.73	1150	232.8	2.72	8.81	150
60	5.65	11.17	2.63	1152	244.1	1.89	8.11	150
65	5.65	11.69	2.87	1154	260.1	1.65	6.87	150
70	5.65	10.84	2.29	1150	276.3	1.98	4.42	150
75	5.65	11.06	2.25	1150	289.8	1.67	3.55	150
80	5.65	10.41	2.02	1148	303.2	1.35	2.26	150
85	5.65	10.37	1.72	1143	321.0	1.13	1.70	150
90	5.65	10.71	1.73	1149	333.1	1.21	1.74	150
95	5.65	10.79	1.73	1151	336.0	1.20	1.69	150

## Water sample:

Time collected: 15:45

Total volume of purged water removed:

6 gallons.

Physical appearance at start

Color clear/light brown  
 Odor none  
 Sheen/Free Product none

Physical appearance at sampling

Color clear  
 Odor none  
 Sheen/Free Product none

## Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH
<u>100ml</u>	<u>Vial</u>	<u>2</u>	<u>N</u>	<u>HCl</u>	<u>VOC's</u>
<u>1 liter</u>	<u>Amber</u>	<u>2</u>	<u>N</u>	<u>None</u>	<u>PCB's</u>





Date	3/18/03	Personnel	JAD/AAA	Weather	Sunny - 45°F
Site Name	SULLIVAN'S LEDGE	Evacuation Method	Bladder Pump	Well #	MW-15
Site Location	NEW BEDFORD, MA	Sampling Method	Low Flow	Project #	2000015.009
Well info:					

Depth of Well •                      ft.  
Depth to Water • 18.25 ft.  
Length of Water Column                      ft.

<input checked="" type="checkbox"/>	Top of Well Casing
<input type="checkbox"/>	Top of Protective Casing
<input type="checkbox"/>	(Other, Specify)

[illegible]

Sheen/Free Product

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container #
10ml	VIAL	2	NO	HCL	ANALYSIS
1 LITER	AMBER	2	NO	NONE	- VOCs - PCBS

April 25, 1997  
Form developed by

# Low Flow Ground Water Sampling Log

Date 3/18/03 Personnel AAA/CAD Weather Cloudy, 40°F  
 Site Name Sullivan's ledge Evacuation Method Bladder Pump Well # MW-24  
 Site Location New Bedford Sampling Method Low Flow Project # 2000015-009

## Well information:

Depth of Well \* \_\_\_\_\_ ft.  
 Depth to Water \* 17-01 ft.  
 Length of Water Column \_\_\_\_\_ ft.

\* Measurements taken from

☒ Top of Well Casing  
☐ Top of Protective Casing  
 (Other, Specify) \_\_\_\_\_

PAGE  
1 OF 2

Water parameters: Lower submersible pump slowly through stagnant water column  
 Position pump in center of screened interval & maximum pumping rate of 0.5 liters/minute  
 Collect readings at every three minute intervals

Elapsed Time	Depth To Water	Temperature	pH	Conductivity	Oxidation Reduction Potential	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (ml/min).
0	17.15	10.48	6.86	966	-26.4	2.87	342	350
5	17.21	10.97	6.71	973	-45.0	2.26	341	500
10	17.29	11.03	6.66	955	-41.1	2.23	334	325
15	17.30	11.08	6.65	942	-41.3	2.06	282	225
20	17.33	11.11	6.63	921	-39.3	1.98	216	225
25	17.37	11.18	6.61	903	-40.9	2.08	166	225
30	17.40	11.22	6.60	878	-38.1	2.24	140	225
35	17.37	11.08	6.60	863	-37.7	2.09	140	200
40	17.40	11.13	6.59	8430	-37.6	2.53	100	200
45	17.39	11.16	6.60	789	-32.3	2.02	100	200
50	17.39	11.36	6.58	770	-35.5	2.19	101.0	200
55	17.39	11.08	6.59	782	-35.4	2.36	102.7	200
60	17.45	11.37	6.58	873	-36.8	1.76	99.0	200
65	17.50	11.38	6.57	819	-39.0	2.63	90.7	200
70	17.50	11.29	6.57	831	-38.2	3.73	90.3	200
75	17.50	11.32	6.56	856	-35.9	3.26	85.3	200
80	17.50	11.37	6.54	853	-36.6	3.45	87.1	200
85	17.50	11.40	6.54	854	-35.5	3.51	87.0	200
90	17.50	11.51	6.52	852	-36.9	1.98	85.6	200

## Water sample:

Time collected: 11:45

Total volume of purged water removed:

8 G.

Physical appearance at start

Color light orange  
 Odor none

Physical appearance at sampling

Color light orange / clear  
 Odor none

Sheen/Free Product

none

Sheen/Free Product

none

## Samples collected:

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH	Analysis
40 ml	Vial	2	N	HCL		VOCs
1 litre	Amber	2	N	None		PCBs

Notes:

Date	3/18/03	Personnel	AAA/JAD	Weather	Cloudy, 40°F
Site Name	Sullivan	Evacuation Method	Bladder Pump	Well #	MW-24
Site Location	New Bedford	Sampling Method	Low Flow	Project #	2000015.009
Well information:					

PAGE  
2 OF 2

[illegible]

Container Size	Container Type	# Collected	Field Filtered	Preservative	Container pH

April 25, 1997  
Form developed by

**ATTACHMENT C**

**WESTBAY FIELD SHEETS**



Sullivan's Ledge  
Low Flow Groundwater Sampling Equipment  
Calibration Record

Five Alfred Circle, Bedford, Massachusetts 01730  
Phone: (781) 275-6050 Fax: (781) 275-5651

COMPLETED BY: AAA/JAD  
DATE: 3/17/03  
TIME: 10:50

INSTRUMENT MODEL: YSI 9245A 6920 YSI Calibration Record

	STANDARD	INITIAL READING	CALIBRATED READING
pH	7	7.52	7.0
	4	3.80	3.99
	10	9.78	9.98
ORP	100 mV	198.7 mV	100.0
Specific Conductance	1000 $\mu$ S/cm	867 $\mu$ S/cm	999 $\mu$ S/cm
Dissolved Oxygen	100%	87.6 %	97.3 %

INSTRUMENT MODEL: LaMotte 2020 Turbidity Meter Calibration Record

	STANDARD	INITIAL READING	CALIBRATED READING
Turbidity	0	2.37	0.0
	10	7.0	9.86



Five Alfred Circle, Bedford, Massachusetts 01730  
Phone: (781) 275-6050 Fax: (781) 275-5651

**Sullivan's Ledge  
Low Flow Groundwater Sampling Equipment  
Calibration Record**

COMPLETED BY: JAO

DATE: 3/17/02

TIME: 16:10

*END OF DAY CHECK.*

INSTRUMENT MODEL: 6820 YSI YSI Calibration Record

	STANDARD	INITIAL READING	CALIBRATED READING
pH	7	<del>7.02</del>	
	4	4.03	
	10	10.03	
ORP	100mV	103.0mV	
Specific Conductance	1000 uS/cm	1001.0 uS/cm	
Dissolved Oxygen	100%	99.4%	

INSTRUMENT MODEL: LaMotte 2020 Turbidity Meter Calibration Record

	STANDARD	INITIAL READING	CALIBRATED READING
Turbidity	0	0.29	
	10	9.78	



Five Alfred Circle, Bedford, Massachusetts 01730  
 Phone: (781) 275-6050 Fax: (781) 275-5651

Sullivan's Ledge  
 Low Flow Groundwater Sampling Equipment  
 Calibration Record

COMPLETED BY: JAD  
 DATE: 3/18/03  
 TIME: 8:00

YSI Calibration Record

INSTRUMENT MODEL: 6920 Y61

	STANDARD	INITIAL READING	CALIBRATED READING
pH	7	6.93	6.99
	4	3.58	4.00
	10	10.01	10.00
ORP	100mV	115.9	100.0
Specific Conductance	1000 us/cm	937	1007
Dissolved Oxygen	100%	120%	99.1

Turbidity Meter Calibration Record

INSTRUMENT MODEL: LaMotte 2020

	STANDARD	INITIAL READING	CALIBRATED READING
Turbidity	0	0	0
	10	12.2	9.99



Five Alfred Circle, Bedford, Massachusetts 01730  
 Phone: (781) 275-6050 Fax: (781) 275-5651

Sullivan's Ledge  
 Low Flow Groundwater Sampling Equipment  
 Calibration Record

**END OF DAY CHECK.**

COMPLETED BY: JAD  
 DATE: 3/18/03  
 TIME: 16:15

YSI Calibration Record  
 INSTRUMENT MODEL: 6920 YSI

	STANDARD	INITIAL READING	CALIBRATED READING
pH	7	7.08	
	4	4.03	
	10	10.01	
ORP	100 mV	100.8	
Specific Conductance	1000 uS/cm	998	
Dissolved Oxygen	100%	130%	

Turbidity Meter Calibration Record  
 INSTRUMENT MODEL: LaMotte 2020

	STANDARD	INITIAL READING	CALIBRATED READING
Turbidity	0	0.0	
	10	10.07	





Five Alfred Circle, Bedford, Massachusetts 01730  
Phone: (781) 275-6050 Fax: (781) 275-5651

Sullivan's Ledge  
Low Flow Groundwater Sampling Equipment  
Calibration Record

COMPLETED BY: JAD  
DATE: 3/19/03  
TIME: 7:30

YSI Calibration Record

INSTRUMENT MODEL: 751 6920

	STANDARD	INITIAL READING	CALIBRATED READING
pH	7	7.46	7.00
	4	<del>12.34</del> 4.25	4.00
	10	10.31	10.03
ORP	100mV	98.6	99.9
Specific Conductance	1000 us/cm	996.8	999.9
Dissolved Oxygen	100%	98.1	100.4

Turbidity Meter Calibration Record

INSTRUMENT MODEL: LaMotte 2020

	STANDARD	INITIAL READING	CALIBRATED READING
Turbidity	0.0	0.0	0.0
	10.0	10.21	9.98



Five Alfred Circle, Bedford, Massachusetts 01730  
 Phone: (781) 275-6050 Fax: (781) 275-5651

Sullivan's Ledge  
 Low Flow Groundwater Sampling Equipment  
 Calibration Record

END OF DAY CHECK

COMPLETED BY: JAD  
 DATE: 3/19/03  
 TIME: 13:00

YSI Calibration Record  
 INSTRUMENT MODEL: 6920 YSI

	STANDARD	INITIAL READING	CALIBRATED READING
pH	7	7.06	
	4	3.99	
	10	10.13	
ORP	100mV	98.8	
Specific Conductance	1000 uS/cm	1052	
Dissolved Oxygen	100%	102.9%	

Turbidity Meter Calibration Record  
 INSTRUMENT MODEL: LaMotte 2020

	STANDARD	INITIAL READING	CALIBRATED READING
Turbidity	0	0	
	10	10.70	



# CHAIN OF CUSTODY

PAGE 1 OF 1

Eight Walkup Drive Westborough, MA 01581  
TEL: 508-898-9220 FAX: 508-898-9193

## Client Information

Client: MABBETT & ASSOC.

Address: 5 ALFRED CIRCLE  
BEDFORD, MA

Phone: 781 275 6050

Fax: 781 275 5651

Email: steinberg@mabbett.com

☒ These samples have been previously analyzed by Alpha

## Other Project Specific Requirements/Comments:

TRIP + TEMP. BLANK IN COOLER  
METALS → REPORT 7 LIST  
VOC'S → REPORT SHORT LIST

## Project Information

Project Name: SULLIVANS LEDGE

Project Location: NEW BEDFORD

Project #: 2000015-009

Project Manager: Paul Steinberg

ALPHA Quote #:

## Turn-Around Time

☒ Standard

☐ RUSH (only confirmed if pre-approved!)

Date Due:

Time:

Date Rec'd in Lab:

## Report Information - Data Deliverables

☐ FAX

☒ ADEx

Criteria Checker:

(Default based on Regulatory Criteria Indicated)

Other Formats:

☐ EMAIL (standard pdf report)

☒ Additional Deliverables:

Hard copy Also

Report to: (if different than Project Manager)

Paul Steinberg

ALPHA Job #:

## Billing Information

☐ Same as Client info

PO #:

O'Brien - Gere

## Regulatory Requirements/Report Limits

State /Fed

Program

Criteria

## SAMPLE HANDLING

Filtration

☐ Done

☐ Not needed

☐ Lab to do

Preservation

☐ Lab to do

(Please specify below)

## Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials															
		Date	Time																	
	OBG-3	3/19/03	15:00	GW	JAD	2	2	1												
	MW-2	3/19/03	16:00	GW	JAD	2	2													
	MW-14	3/19/03	9:45	GW	JAD	2	1													
	GCA-1	3/19/03	11:15	GW	JAD	2	2													
	GCA-1-MS	3/19/03	11:15	GW	JAD	2	2													
	GCA-1-MSD	3/19/03	11:15	GW	JAD	2	2													
	TRIP	3/10/03	16:15		DS	1														

Shaded Gray Areas For Lab Use Only

Container Type

VAP

Preservative

BAC

Relinquished By:

Date/Time

Received By:

Date/Time

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.



# CHAIN OF CUSTODY

PAGE 3 OF 3

Eight Walkup Drive Westborough, MA 01581  
TEL: 508-898-9220 FAX: 508-898-9193

## Client Information

Client: Mabbett & Associates Inc

Address: 5 Alfred Circle  
Bedford MA 01730

Phone: 781-275-6050

Fax: 781-275-5651

Email: Steinberg@mabbett.com

☐ These samples have been previously analyzed by Alpha

## Other Project Specific Requirements/Comments:

Temp. Blank + Trip Blank in cooler  
Metals → 7 list  
VOC's → Short list

## Project Information

Project Name: Sullivan's Ledge

Project Location: New Bedford MA

Project #: 2000015.009

Project Manager: Paul D Steinberg

ALPHA Quote #:

## Turn-Around Time

☒ Standard

☐ RUSH (only confirmed if pre-approved!)

Date Due:

Time:

Date Rec'd in Lab:

## Report Information - Data Deliverables

☐ FAX

☒ ADEx

Criteria Checker:

(Default based on Regulatory Criteria Indicated)

Other Formats:

☐ EMAIL (standard pdf report)

☐ Additional Deliverables:

Report to: (if different than Project Manager)

Paul Steinberg

ALPHA Job #:

## Billing Information

Sample Client Info

PO #:

O'Brien & Gere

## Regulatory Requirements/Report Limits

State /Fed

Program

Criteria

## SAMPLE HANDLING

Filtration

☐ Done

☒ Not needed

☐ Lab to do

Preservation

☐ Lab to do

(Please specify below)

## Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials											TOTAL # BOTTLES
		Date	Time													
	BEI-1	3/18/03	14:00	G-W	WFS	X	X	X								5
	OBG-1		14:05			X	X	X								5
	OBG-2		14:10			X	X	X								5
	BEI-2		14:15			X	X	X								5
	BEI-3		14:20			X	X	X								5
	BEI-3 MS		14:20			X	X	X								5
	BEI 3 MSD		14:20			X	X	X								5
	Collection Trench		14:25			X	X	X								5
	Dup #2		12:00			X	X	X								5
	Trip Blank	3/10/03	16:15		DS	X										1

Shaded Gray Areas For Lab Use Only

Container Type

V A P

Preservative

B A C

Relinquished By:

Date/Time

3/18/03  
15:10

Received By:

L Edmonds

Date/Time

3/18/03 15:30

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.



# CHAIN OF CUSTODY

PAGE 1 OF 3

Eight Walkup Drive Westborough, MA 01581  
TEL: 508-898-9220 FAX: 508-898-9193

## Client Information

Client: MABBE-TT  
Address: 5 ALFRED CIRCLE  
BEDFORD, MA  
Phone: 781 275 6050  
Fax: 781 275 5651  
Email: steinberg@mabbett.com  
☐ These samples have been previously analyzed by Alpha

## Project Information

Project Name: Sullivan's Leaky  
Project Location: New Bedford  
Project #: 2000015 009  
Project Manager: Paul Steinberg  
ALPHA Quote #:  
Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)  
Date Due: Time:

## Other Project Specific Requirements/Comments:

TRIPBLANK & TCMPL BLANK IN COOLICK  
WATER SHORT LIST

Date Rec'd in Lab:

## Report Information - Data Deliverables

☐ FAX  
☒ ADEX  
Criteria Checker: \_\_\_\_\_  
(Default based on Regulatory Criteria Indicated)  
Other Formats: \_\_\_\_\_  
☐ EMAIL (standard pdf report)  
☐ Additional Deliverables: Hand Copy Also  
Report to: (if different than Project Manager) Paul Steinberg

ALPHA Job #:

## Billing Information

☐ Same as Client info PO #:

O'Brien & Gere

## Regulatory Requirements/Report Limits

State /Fed Program Criteria

## SAMPLE HANDLING

Filtration  
☐ Done  
☐ Not needed  
☐ Lab to do  
Preservation  
☐ Lab to do  
(Please specify below)

## Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials	ANALYSIS	TOTAL # BOTTLES
		Date	Time				
	MW-15	3/10/03	14:30	GW	AAA	22	
	MW-6	3/17/03	12:05	GW	JAD	2	
	ECT-2-47	3/17/03	12:05	1	CLM	2	
	ECT-2-82	3/17/03	13:15	1	CIM	2	
	ECT-2-117	3/17/03	13:45	1	CIM	2	
	ECT-2-152	3/17/03	14:10	1	CLM	2	
	ECT-2-187	3/17/03	14:40	1	CLM	2	
	DUP # 1	3/17/03	8:00	✓	CLM	2	
	TRIP	3/10/03	16:15		DS	1	

Shaded Gray Areas For Lab Use Only

Container Type

V A

Preservative

B A

Relinquished By:

Date/Time

3/15/03 15:30

Received By:

Date/Time

3/15/03 15:30

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.



# CHAIN OF CUSTODY

PAGE 2 OF 3

Eight Walkup Drive Westborough, MA 01581  
TEL: 508-898-9220 FAX: 508-898-9193

## Client Information

Client: MABBEY CONSULTANTS  
Address: 5 ALFRED CIRCLE  
WESTBOROUGH, MA 01581  
Phone: (781) 375-6050  
Fax: 375-7651  
Email: \_\_\_\_\_

☒ These samples have been previously analyzed by Alpha

## Other Project Specific Requirements/Comments:

IN ADDITION TO THE BLANK INVOICES - WORKER  
METALS ANALYSIS -> 7 METALS  
VOC'S - SHORT LIST.

## Project Information

Project Name: SULLIVANS LODGE  
Project Location: 1200 BROAD, MA  
Project #: 2000015 009  
Project Manager: P STEINBERG  
ALPHA Quote #: \_\_\_\_\_  
Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: \_\_\_\_\_ Time: \_\_\_\_\_

Date Rec'd in Lab: \_\_\_\_\_

## Report Information - Data Deliverables

☐ FAX  
☒ ADEX  
Criteria Checker: \_\_\_\_\_  
(Default based on Regulatory Criteria Indicated)  
Other Formats: \_\_\_\_\_  
☐ EMAIL (standard pdf report)  
☒ Additional Deliverables: Handcopy also  
Report to: (if different than Project Manager)  
P STEINBERG

ALPHA Job #: \_\_\_\_\_

## Billing Information

☐ Same as Client info PO #: \_\_\_\_\_

OBRICK - CORE

## Regulatory Requirements/Report Limits

State /Fed Program Criteria

## SAMPLE HANDLING

Filtration  
☐ Done  
☐ Not needed  
☐ Lab to do  
Preservation  
☐ Lab to do  
(Please specify below)

## Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials										
		Date	Time												
	ECJ-1-37	3/18/03	9:09	GW	WFS	2									
	ECJ-1-62		9:35			2									
	ECJ-1-72		11:15			2									
	ECJ-1-122		11:25		✓	2									
	ECJ-1-148		12:40		CLM	2									
	ECJ-1-267		13:00		WFS	2									
	EQUIP. BLANK		13:15		WFS	2									
	MW-4	✓	9:00		JAD	2	2								
	MW-6A	3/17/03	15:15		JAD	2	2								
	MW-24	3/18/03	11:45		JAP	2	2								

Shaded Gray Areas For Lab Use Only

Container Type VA

Preservative BA

Relinquished By: [Signature]

Date/Time 3/18/03

Received By: [Signature]

Date/Time 3/18/03 1530

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms. See reverse side.

Table 1  
Sullivan's Ledge Superfund Site  
New Bedford, MA  
Groundwater Elevations - Conventional Wells  
March 25, 2003

Well	Top of Casing Elevation	Reference Point	Source	Depth to Water	Date	Groundwater Elevation	Notes
GCA-1	84.06	Plastic Cap	SITEC 08/10/01	12.50	3/25/2003	71.56	(1)
MW-2	101.81	Plastic Cap	SITEC 08/10/01	15.71	3/25/2003	86.10	(1)
MW-4	90.17	Top pipe	SITEC 08/10/01	8.16	3/25/2003	82.01	
MW-4A	90.10	Top of PVC	SITEC 08/10/01		3/25/2003		(2)
MW-5	82.79	Top pipe	SITEC 08/10/01	7.53	3/25/2003	75.26	
MW-5A	82.30	Top of PVC	SITEC 08/10/01	7.89	3/25/2003	74.41	
MW-6	73.81	Top pipe	SITEC 08/10/01	5.46	3/25/2003	68.35	
MW-6A	73.54	Top of PVC	SITEC 08/10/01	5.12	3/25/2003	68.42	
MW-7A	66.91	Top of PVC	SITEC 08/10/01				(3)
MW-8	69.97	Top pipe	SITEC 08/10/01	2.85	3/25/2003	67.12	
MW-8A	70.00	Top of PVC	SITEC 08/10/01	3.51	3/25/2003	66.49	
MW-9A	66.53	Top of PVC	SITEC 08/10/01			66.53	(3)
MW-10	68.20	Top pipe	SITEC 08/10/01	1.30	3/25/2003	66.90	
MW-10A	70.54	Top of PVC	SITEC 08/10/01	4.77	3/25/2003	65.77	
MW-10B	68.35	Top pipe	SITEC 08/10/01	1.50	3/25/2003	66.85	
MW-12	83.91	Top of PVC	SITEC 08/10/01				(4)
MW-12A	84.15	Top of PVC	SITEC 08/10/01	8.01	3/25/2003	76.14	
MW-12AR	85.04	Top of PVC	SITEC 08/10/01	12.73	3/25/2003	72.31	
MW-13	89.49	Plastic Cap	SITEC 08/10/01	15.20	3/25/2003	74.29	(1)
MW-13A	89.48	Top of PVC	SITEC 08/10/01	15.18	3/25/2003	74.30	
MW-14	101.46	Top of PVC	SITEC 08/10/01	15.00	3/25/2003	86.46	
MW-15	112.31	Top of PVC	SITEC 08/10/01	18.13	3/25/2003	94.18	
MW-16	120.55	Top of PVC	SITEC 08/10/01	19.75	3/25/2003	100.80	
MW-17	92.56	Top of PVC	SITEC 08/10/01	18.78	3/25/2003	73.78	
MW-22A	85.00	Top of PVC	SITEC 08/10/01	13.65	3/25/2003	71.35	
MW-24	112.23	Plastic Cap	SITEC 08/10/01	16.82	3/25/2003	95.41	(1)
PZ-1	66.73	Top of PVC	SITEC 08/10/01	1.12	3/25/2003	66.73	
PZ-2	65.91	Top of PVC	SITEC 08/10/01	3.20	3/25/2003	62.71	
PZ-3	65.91	Top of PVC	SITEC 08/10/01	4.35	3/25/2003	65.91	
PZ-5/WP-5	67.01	Top of PVC	SITEC 08/10/01				(3)
PZ-6	68.06	Top of PVC	SITEC 08/10/01	4.78	3/25/2003	63.28	
PZ-10	85.72	Top of PVC	SITEC 08/10/01	14.10	3/25/2003	71.62	
PZ-11	73.79	Top of PVC	SITEC 08/10/01	3.81	3/25/2003	69.98	
PZ-12	82.46	Top of PVC	SITEC 08/10/01	11.35	3/25/2003	71.11	
PZ-13	73.28	Top of PVC	SITEC 08/10/01	3.62	3/25/2003	69.66	
PZ-West (14A)	86.73	Top of PVC	SITEC 08/10/01	10.66	3/25/2003	76.07	
PZ-East (15A)	85.98	Top of PVC	SITEC 08/10/01	9.62	3/25/2003	76.36	
PZ-16 (Shal)		Top of PVC		3.88	3/25/2003		(5)
PZ-16 (Inter)		Top of PVC		3.62	3/25/2003		(5)
PZ-16 (Deep)		Top of PVC		5.52	3/25/2003		(5)
PZ-17 (Shal)		Top of PVC		4.95	3/25/2003		(5)
PZ-17 (Inter)		Top of PVC		5.62	3/25/2003		(5)
PZ-17 (Deep)		Top of PVC		5.42	3/25/2003		(5)
PZ-18 (Shal)		Top of PVC		8.15	3/25/2003		(5)
PZ-18 (Inter)		Top of PVC		8.47	3/25/2003		(5)
PZ-18 (Deep)		Top of PVC		7.92	3/25/2003		(5)
PZ-19	64.89	Top of PVC	HLA 10/25/01	2.71	3/25/2003	62.18	
PZ-20	65.38	Top of PVC	HLA 10/25/01	3.15	3/25/2003	62.23	
PZ-21	65.48	Top of PVC	HLA 10/25/01	2.47	3/25/2003	63.01	
PZ-22	67.38	Top of PVC	HLA 10/25/01	3.22	3/25/2003	64.16	

Notes:

- Survey elevation is top of PVC cap associated with low flow equipment; depth to groundwater is from top of casing. As a result, actual groundwater elevation is 0.05 to 0.01 ft lower than shown.
- Probe hits pump at 7.30 feet.
- No measurement taken.
- No DTW measurement taken. Installed tubing prevents measurement.
- Top of casing not surveyed.

Table 2  
Sullivan's Ledge Superfund Site  
Westbay Well Groundwater Elevations  
March 25, 2003

Well	Date	Depth Log (ft)	Depth Cable (ft)	P <sub>i</sub> (psi) <sup>(1)</sup>	P <sub>o</sub> (psi) <sup>(1)</sup>	ΔH (ft)	D <sub>MP</sub> (ft) <sup>(1)</sup>	D <sub>z</sub> (ft)	E <sub>MP</sub> (ft) <sup>(2)</sup>	PL (ft) <sup>(3)</sup>
ECJ-1	3/25/2003	37	41	20.44	23.48	7.01	33.96	26.95	89.81	62.86
ECJ-1	3/25/2003	62	66	31.36	38.38	16.19	33.96	17.77	89.81	72.04
ECJ-1	3/25/2003	72	76	33.53	35.34	4.18	33.96	29.78	89.81	60.03
ECJ-1	3/25/2003	122	126	55.35	56.84	3.44	33.96	30.52	89.81	59.29
ECJ-1	3/25/2003	148	151	66.24	67.70	3.37	33.96	30.59	89.81	59.22
ECJ-1	3/25/2003	267	271	118.45	169.34	117.39	33.96	-83.43	89.81	173.24
ECJ-2	3/25/2003	47	47	29.31	33.50	9.67	14.93	5.26	72.31	67.05
ECJ-2	3/25/2003	82	82	43.45	55.32	27.38	14.93	-12.45	72.31	84.76
ECJ-2	3/25/2003	117	117	58.48	63.85	12.39	14.93	2.54	72.31	69.77
ECJ-2	3/25/2003	152	152	73.97	77.83	8.90	14.93	6.03	72.31	66.28
ECJ-2	3/25/2003	187	187	87.88	91.66	8.72	14.93	6.21	72.31	66.10
ECJ-3	3/25/2003	51	63	16.59	31.00	33.24	60.24	27.00	120.74	93.74
ECJ-3	3/25/2003	91	103	34.09	48.31	32.80	60.24	27.44	120.74	93.30
ECJ-3	3/25/2003	126	138	49.37	63.49	32.57	60.24	27.67	120.74	93.07
ECJ-3	3/25/2003	146	158	58.09	71.88	31.81	60.24	28.43	120.74	92.31
ECJ-4	3/25/2003	62	62	32.57	37.66	11.74	12.12	0.38	70.59	70.21
ECJ-4	3/25/2003	87	87.5	43.51	51.39	18.18	12.12	-6.06	70.59	76.65
ECJ-4	3/25/2003	132	132.8	63.15	71.06	18.25	12.12	-6.13	70.59	76.72
ECJ-4	3/25/2003	162	162.9	76.20	84.06	18.13	12.12	-6.01	70.59	76.60
ECJ-4	3/25/2003	227	227.6	104.24	112.02	17.95	12.12	-5.83	70.59	76.42
ECJ-4	3/25/2003	245	248.1	112.82	120.58	17.90	12.12	-5.78	70.59	76.37

**Notes:**

1. Measured by Mabbett & Associates.
2. Top of casing provided by HLA on August 10, 2001.
3. Calculated by Mabbett & Associates, Inc. based on procedure provided by Westbay.

P<sub>i</sub> = Pressure reading inside measuring port casing

P<sub>o</sub> = Pressure reading outside measuring port casing

ΔH = (P<sub>o</sub>-P<sub>i</sub>)/w w=0.4335 psi/ft

D<sub>MP</sub> = Depth to water inside monitoring port casing (below top of monitoring port)

D<sub>z</sub> = Depth to static level for monitoring zone = D<sub>MP</sub>-ΔH

E<sub>MP</sub> = Elevation of measuring port casing

PL = piezometric level = E<sub>MP</sub>-D<sub>z</sub>



Table 3  
Sullivan's Ledge Superfund Site  
Groundwater Elevations - Recovery Points  
March 25, 2002

Recovery Point	Top of Casing Elevation	Reference Point	Source	Depth to Water	Date	Groundwater Elevation	Notes
BEI-1	91.40	Top Cover	SITEC 08/10/01	30.20	3/25/2003	61.20	(1)
OBG-1	88.96	Top Cover	SITEC 08/10/01	29.10	3/25/2003	59.86	(1)
OBG-2	85.65	Top Cover	SITEC 08/10/01	41.88	3/25/2003	43.77	(1)
BEI-2	88.06	Top Cover	SITEC 08/10/01	39.93	3/25/2003	48.13	(1)
OBG-3	90.56	Top Cover	SITEC 08/10/01	55.75	3/25/2003	34.81	(1)
BEI-3	92.71	Top Cover	SITEC 08/10/01	34.70	3/25/2003	58.01	(1)
SCTPS	86.02	Top, East Side	SITEC 05/10/99	15.28	3/25/2003	70.74	(2)
IW-E	84.32	Top of Casing	SITEC 08/10/01	17.12	3/25/2003	67.20	
IW-W	88.79	Top of Casing	SITEC 08/10/01	17.45	3/25/2003	71.34	

Notes:

1. Survey elevation is top of cover; depth to groundwater is from top of casing.  
As a result, actual groundwater elevation is 0.05 to 0.01 ft lower than shown.
2. SCTPS = Shallow Collection Trench Pump Station

Table 4  
Sullivan's Ledge Superfund Site  
New Bedford, MA  
Recovery Well Extraction Rates Summary  
3/14/03 - 3/25/03

Location	3/14/2003	3/17/2003 <sup>(1)</sup>	3/18/2003	3/19/2003 <sup>(2)</sup>	3/20/2003 <sup>(3)</sup>	3/21/2003	3/24/2003	3/25/2003
	Flow Rate (gpm)	Flow Rate (gpm)	Flow Rate (gpm)	Flow Rate (gpm)	Flow Rate (gpm)	Flow Rate (gpm)	Flow Rate (gpm)	Flow Rate (gpm)
BEI-1	1.47	1.83	1.80	1.69	1.95	1.66	1.59	1.58
OBG-1	1.14	1.39	1.35	1.35	1.39	1.24	1.18	1.20
OBG-2	2.63	2.77	2.76	2.74	2.83	2.74	2.74	2.75
BEI-2	0.61	0.71	0.63	0.60	0.76	0.60	0.60	0.62
OBG-3	offline	offline	offline	0.58	0.91	0.67	0.67	0.67
BEI-3	1.27	1.29	1.28	1.29	1.33	1.29	1.28	1.30
Collection Trench	25.01	20.01	30.95	31.91	25.01	31.96	30.02	29.93

**Notes:**

<sup>(1)</sup> System was shut down from 19:23 3/15/03 until 8:00 3/17/03.

<sup>(2)</sup> Recovery well OBG-3 was brought back on line on 3/18/03 afternoon after replacement of the pump.

<sup>(3)</sup> System was down from 21:10 on 3/19/03 until 8:15 3/20/03.

## Westbay Well Sampling Logs



Westbay  
Instruments Inc.

Page 1 of 4

# Groundwater Sampling

Field Data Sheet

Project Sullivan's Hedge Location New Bedford Date 3/18/03  
Monitoring Well No. ECJ-1 Sampling Zone No. 37 Start Time 0900 End Time 9127  
Water Level In MP Casing: (start) 32.78 (end) 32.84 Technicians CLM/WFS  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks									Comments
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve		Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )	
1	✓	✓	✓	✓	✓	✓	(41')	19.14	✓	24.88	✓	24.89	✓	✓	19.14	0.25L	
																Total Volume	0.25L.

Field Determinations (Appearance, pH, S.C., etc.)

Sample taken @ 9:09



## Field Data Sheet

Project Sullivan's Ledge Location New Bedford Date 3-18-03  
Monitoring Well No. ECJ-1 Sampling Zone No. 62 Start Time 9:30 End Time 9:45  
Water Level In MP Casing: (start) 32.84 (end) 32.86 Technicians CLM/WFS  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks								Comments	
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )		Volume Retrieved ( )
1	✓	✓	✓	✓	✓	✓	(66')	30.10	✓	35.00	X	34.94	X	X	30.05	0.25L	

Field Determinations (Appearance, pH, S.C., etc.)

Sampled @ 9:35



Westbay  
Instruments Inc.

Page 3 of 6

# Groundwater Sampling

Field Data Sheet

Project Sullivan's Ledge Location New Bedford Date 3/18/03  
Monitoring Well No. EC5-1 Sampling Zone No. 72 Start Time 11:00 End Time 11:20  
Water Level In MP Casing: (start) 32.86 (end) 32.90 Technicians CLM/WFS  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks								Comments	
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve		Locate port release arm land probe	Pressure In MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe		Pressure in MP ( )
1	✓	✓	✓	✓	✓	✓	(76)	34.20	✓	34.02	✓	34.00	✓	✓	34.21	252	
																Total Volume	0.25 litre

Field Determinations (Appearance, pH, S.C., etc.)

Sample taken @ 11:15

# Groundwater Sampling

Field Data Sheet

Project Sullivan's Hedge Location New Bedford Date 3/16/03  
 Monitoring Well No. ECT-1 Sampling Zone No. 122 Start Time 11:20 End Time 11:30  
 Water Level In MP Casing: (start) 32.90 (end) 32.95 Technicians CLM/WFS  
 Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks								Comments	
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve		Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe		Pressure in MP ( )
1	✓	✓	✓	✓	✓	✓	(126)	56.00	✓	68.10	✓						
2	✓	✓	✓	✓	✓	✓	(126)	56.00	✓	55.47	✓	55.39	X	X	56.00	.25L	vacuum fail
																Total Volume	0.25L

Field Determinations (Appearance, pH, S.C., etc.)

Sample taken @ 11:25



## Groundwater Sampling

## Field Data Sheet

Project Sullivan's Ledge. Location New Bedford Date 3/18/03  
Monitoring Well No. EC5-1 Sampling Zone No. 148 Start Time 12:35 End Time 12:45  
Water Level In MP Casing: (start) 33.68 (end) 33.70 Technicians CLM / WFS  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks									Comments
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )	Volume Retrieved ( )	
1	/	✓	✓	✓	✓	✓	(151)	66.82	/	66.36	✓	66.29	x	x	66.81	.25L	
			</														

**Field Determinations (Appearance, pH, S.C., etc.)**

Sample taken @ 1240

**MXSA<sup>®</sup>**





## Groundwater Sampling

## Field Data Sheet

Project Sullivan's Ledge Location New Bedford Date 3/16/03  
Monitoring Well No. ECS-1 Sampling Zone No. 267 Start Time 12:00 End Time 13:10  
Water Level In MP Casing: (start) 33.20 (end) 33.77 Technicians CLM/WFS  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

**Collection Bottle Preparation - See Sampling Plan**

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks									Comments
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )	Volume Retrieved ( )	
1	✓	✓	✓	✓	✓	✓	(271)	118.99	✓	129.30	✓	129.02	✓	✓	118.98	.25	
																Total Volume	0.25 L

**Field Determinations (Appearance, pH, S.C., etc.)**

Sample taken @ 1300



# Groundwater Sampling

## Field Data Sheet

Project Sullivan's Hedge Location New Bedford Date 3-17-03  
Monitoring Well No. ECT-20 Sampling Zone No. 47 Start Time 11:40 End Time 12:30  
Water Level In MP Casing: (start) 14.90 (end) 15.00 Technicians CLM  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks								Comments	
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )		Volume Retrieved ( )
1	✓	✓	✓	✓	✓	✓	(U7)	30.08	✓	33.40	✓	33.37	✓	✓	30.01	0.500 L	

Field Determinations (Appearance, pH, S.C., etc.)

Dup #1      Taken @ 12:05  
Sample taken @ 12:05



## Field Data Sheet

Project Sullivan's Wedge Location New Bedford Date 3-17-03  
Monitoring Well No. EW-2 Sampling Zone No. 82 Start Time 13:00 End Time 13:20  
Water Level In MP Casing: (start) 15.0 (end) 15.10 Technicians CLM  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks									Comments
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )	Volume Retrieved ( )	
1	x	x	x	x	x	x	(82')	45.28	x	49.07	x	48.69	x	x	45.24	.56	

Field Determinations (Appearance, pH, S.C., etc.)

Sample taken @ 13:15

# Groundwater Sampling

Field Data Sheet

Project Sullivan's Ledge Location New Bedford Date 3-17-03  
 Monitoring Well No. ECT-2 Sampling Zone No. 117 Start Time 13:30 End Time 13:50  
 Water Level In MP Casing: (start) 15.16 (end) 15.15 Technicians CLM  
 Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks									Comments
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve		Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )	
1	X	X	X	X	X	X	(117')	59.73	X	63.85	X	63.84	X	X	59.73	.25L	
																Total Volume	0.25

Field Determinations (Appearance, pH, S.C., etc.)

Sample taken @ 13:45



## Field Data Sheet

Project Sullivan's hedge Location New Bedford Date 3/17/03  
Monitoring Well No. ECT-2 Sampling Zone No. 152 Start Time 14:00 End Time 14:25  
Water Level In MP Casing: (start) 15.15 (end) 15.15 Technicians CLM  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks									Comments
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )	Volume Retrieved ( )	
1	X	X	X	✓	✓	✓	(152)	74.18	X	78.60	X	78.08	X	X	74.19	.25L	
																Total Volume	0.256L

**Field Determinations (Appearance, pH, S.C., etc.)**

Sample taken @ 14:00

# Groundwater Sampling

Page 5 of 5

## Field Data Sheet

Project Sullivan's Lodge Location New Bedford Date 3/17/03  
Monitoring Well No. EGJ-2 Sampling Zone No. 187 Start Time 14:30 End Time 14:40  
Water Level In MP Casing: (start) 15.00 (end) 15.20 Technicians CLM  
Sampler Probe Preparation - See Sampling Plan Collection Bottle Preparation - See Sampling Plan

Collection Bottle Preparation - See Sampling Plan

Run No.	Surface Function Checks						Position Sampler	Sample Collection Checks									Comments
	Activate Shoe	Close Valve	Check Vacuum	Open Valve	Evacuate Container	Close Valve	Locate port release arm land probe	Pressure in MP ( )	Activate Shoe	Pressure in Zone ( )	Open Valve	Final Zone Pressure ( )	Close Valve	Retract Shoe	Pressure in MP ( )	Volume Retrieved ( )	
1	X	X	X	X	X	X	(187)	88.05	X	92.53	X	91.70	X	X	88.06	.25L	
																Total Volume	0.25L

Field Determinations (Appearance, pH, S.C., etc.)

Field Determinations (Appearance, pH, S.C., etc.)

Sample taken @ 14:40

## Spring 2003 Data Validation Report

**REPORT**

**Sullivan's Ledge Superfund Site  
Ground Water Data Validation  
Spring 2003 Round**

Sullivan's Ledge Project  
Management Committee

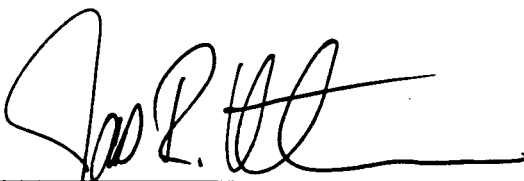
June 2003



# REPORT

## Sullivan's Ledge Superfund Site Ground Water Data Validation Spring Round

*Sullivan's Ledge Project  
Management Committee*



---

James R. Heckathorne, P.E.  
Vice President

June 2003



**O'BRIEN & GERE**  
ENGINEERS, INC.

---

## Contents

List of Tables .....	i
<b>1. Introduction .....</b>	<b>1</b>
1.1. General considerations .....	1
<b>2. Analytical methods .....</b>	<b>3</b>
<b>3. Data validation protocols .....</b>	<b>5</b>
<b>4. Data quality evaluation .....</b>	<b>9</b>
4.1. Volatile organic analyses .....	9
4.2. PCB analyses .....	10
4.3. Metal analyses .....	11
<b>5. Data usability .....</b>	<b>13</b>

## List of Tables

2.1	Analytical methods .....	3
4.1	Field QC sample collection .....	9

## List of Appendices

A	Validated results
---	-------------------



---

## 1. Introduction

Data validation was performed for the ground water samples and ground water plant treatment influent samples collected from the Sullivan's Ledge Site in New Bedford, Massachusetts from March 17 through 19, 2003. Mabbett & Associates (M&A) performed sample collection activities. Samples were validated for selected volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and selected metals.

### 1.1. General considerations

Validation is a process of determining the suitability of a measurement system for providing useful analytical data. Although the term is frequently used in discussing analytical methods, it applies to all aspects of the process and especially to the samples, their measurement, and the actual data generated. Data validation was performed in accordance with the applicable quality control outlined in the following documents:

- Field Sampling Plan (FSP) and Quality Assurance Project and Quality Assurance Project Plan (QAPP) First Operable Unit, Sullivan's Ledge Site, New Bedford, Massachusetts (O'Brien & Gere, January 2000) as modified by M&A's letter dated March 14, 2001, Alpha Analytical Laboratory Quality Manual (Alpha Analytical, October 2000), and by O'Brien & Gere's letter dated February 11, 2002 as modified by letter dated June 5, 2002.
- Test Methods for Evaluating Solid Wastes: Physical and Chemical Methods, SW-846, Final Update III, (USEPA, December 1996).
- Region I USEPA-New England (NE) Data Validation Functional Guidelines for Evaluating Environmental Analyses, Part II, Volatile/Semivolatile Data Validation Functional Guidelines (USEPA Region I, December 1996).
- USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluation of Organic and Inorganic Analyses (USEPA Region I, November 1988 and February 1989).

- USEPA Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), 540/1-89/002 (USEPA, revised 1992).

The following sections of this document address distinct aspects of the validation process. Section 2 lists the analytical methodology employed in sample analysis. Section 3 lists the data quality assurance/quality control (QA/QC) protocols used to validate the sample data. Specific QA/QC excursions and qualifications performed on the sample data are discussed in Section 4. Data usability with respect to the intended purposes of the data is discussed in Section 5.

## 2. Analytical methods

Samples were analyzed by Alpha Analytical Laboratories utilizing the USEPA methods presented in Test Methods for Evaluating Solid Waste (USEPA, December 1996) shown in Table 2.1.

**Table 2.1 Analytical methods.**

<i>Parameter</i>	<i>Analytical Method</i>
VOCs (12 target)	8260B
PCBs (6 target)	8082
Metals (8 target)	6010B

Source: O'Brien & Gere Engineers, Inc.

Analytical results are presented in Appendix A. The letters found immediately to the right of individual sample results serve to qualify the sample data. When the data validation process identified more than one quality control deficiency, the qualifier added to the sample result represents the cumulative effect of the individual QC excursions. Consistent with the listed guidance document, the following qualifiers may be used during the data validation:

- U Indicates that the compound was analyzed for, but was not detected. The quantitation limit is presented and adjusted for dilution. This qualifier is also used when the quantitation limit is raised due to presence of blank contamination.
- J Indicates that the detected sample result should be considered approximate. This qualifier is used when the data validation process identifies a deficiency in the data generation process.
- UJ Indicates that the detection limit for the analyte in this sample should be considered approximate. This qualifier is used when the data validation process identifies a deficiency in the data generation process.
- R Indicates that the previously reported detection limit or sample result was rejected due to a major deficiency in the data generation procedure. The data should not be used for qualitative or quantitative purposes.



---

### 3. Data validation protocols

Quality control data were evaluated based on accuracy and precision criteria specified in Section 3.3 of the site specific FSP and QAPP and Alpha's QM. The following are method specific QA/QC parameters used in the validation of sample data generated for this investigation:

#### Volatile analyses

- Holding times and sample preservation
- GC/MS tuning criteria
- Initial and continuing calibration
- Blank analysis
- Surrogate recovery
- Internal standard performance
- Matrix spike/matrix spike duplicate (MS/MSD) analysis
- Field duplicate analysis
- Laboratory control sample (LCS) analysis
- System performance
- Target compound identification, quantitation, and reporting limits
- Documentation completeness
- Overall data assessment

#### PCB analyses

- Holding times and sample preservation
- Initial and continuing calibration
- Blank analysis
- Surrogate recovery and retention time shift
- Internal standard performance
- MS/MSD analysis
- Field duplicate analysis
- LCS analysis
- System performance
- Target compound identification, quantitation, and reporting limits
- Documentation completeness
- Overall data assessment



### Metals analyses

- Holding times and sample preservation
- Initial and continuing calibration
- Interference check standard analysis
- Blank analysis
- Matrix spike (MS) analysis
- Laboratory duplicate analysis
- Serial dilution analysis
- Field duplicate analysis
- LCS analysis
- Analyte quantitation and reporting limits
- Documentation completeness
- Overall data assessment

In accordance with the QAPP, laboratory control limits were used to assess MS/MSD, LCS, surrogate, and laboratory duplicate data. Field duplicate data were assessed based on requirements specified in the QAPP. Based on guidance provided in EPA Region I's validation guidelines (USEPA Region I, November 1988, February 1989, December 1996), analytical data were qualified in the following manner when laboratory control limits were not met:

- If percent recoveries were less than laboratory control limits but greater than ten percent, non-detected and detected results were qualified as approximate (UJ, J).
- If percent recoveries were greater than laboratory control limits, detected results were qualified as approximate (J).
- If percent recoveries were less than ten percent, detected results were qualified as approximate (J) and non-detected results were qualified as rejected (R).
- If relative percent differences (RPDs) for MSDs and laboratory duplicates were outside of laboratory control limits, detected results greater than the laboratory reporting limit were qualified as approximate (J).
- If RPDs were >50% ( $>\pm 2 \times \text{MRL}$  for results  $<5 \times \text{MRL}$ ) for field duplicates, detected results greater than the MRL were qualified as approximate (J).

It should be noted that qualification of data for MS/MSD analyses was performed only when both MS and MSD percent recoveries were outside of laboratory control limits. Qualification of data was not performed if MS/MSD or surrogate recoveries were outside of laboratory control limits due to sample dilution. Additionally, for MS/MSD and field duplicate excursions for organic analyses, qualification of data was limited

for the unspiked sample or the field duplicate pair unless otherwise stated.



## 4. Data quality evaluation

This section summarizes the QA/QC parameters that met validation criteria and describes qualifications applied to sample data when QA/QC criteria were not met. Samples that required qualification are identified in the following sections by the sample location documented on the field chain of custody record. Equipment and trip blank data were used to assess contamination that may have been introduced during field sampling and sample shipment and were not qualified with respect to QA/QC excursions.

Field chain of custody records were accurate and complete. Samples were received on ice and cooler temperatures met requirements.

A total of eighteen ground water locations were sampled. In addition, seven ground water treatment influent samples were collected. Field duplicate (ten percent), MS/MSD (five percent), equipment blanks (EB) and trip blanks (TB) were collected at the frequency specified in Section 2.6.6 of the site specific FSP and QAPP. Dedicated sampling equipment was used to collect the ground water samples with the exception of the Westbay wells. An equipment blank was collected from the Westbay sampling equipment as required. Table 4.1 summarizes the field QC samples that were collected.

**Table 4.1. Field QC sample Collection.**

<i>Field Duplicate IDs</i>	<i>MS/MSD ID</i>	<i>Equipment Blank</i>	<i>Trip Blanks</i>
DUP1 = ECJ-2-47	BEI-3	3/18/03	3/18/03
DUP2= BEI-2	GCA-1 (VOCs only)		3/18/03
			3/19/03

**Table Notes:**

Trip blanks were identified by date received. A trip blank was present in each sample cooler containing volatile organic samples as required.

Source: O'Brien & Gere Engineers, Inc.

### 4.1. Volatile organic analyses

Nineteen ground water, seven ground water treatment plant influent, and associated QC samples were analyzed and validated for the following selected VOCs: chlorobenzene, benzene, toluene, ethylbenzene, vinyl chloride, trans-1,2-dichloroethene, trichloroethene, 1,4-dichlorobenzene, m/p-xylenes, o-xylene, cis-1,2-dichloroethene, and naphthalene.

The following QA/QC parameters met validation criteria or did not result in qualification of data:

- Holding times and sample preservation
- GC/MS tuning criteria
- Initial and continuing calibration
- Blank analysis
- Surrogate recovery
- Internal standard performance
- MS/MSD analysis
- LCS analysis
- System performance
- Target compound identification and quantitation
- Documentation completeness

Field duplicate analysis. Precision criteria was not met for vinyl chloride (RPD 39%) in field duplicate pairs ECJ-2-47 and DUP1(ECJ-2-47). Detected results for vinyl chloride were qualified as approximate in samples ECJ-2-47 and DUP1(ECJ-2-47).

**Target compound identification and reporting limits.** Target compound identification was performed in accordance with method requirements. Elevated reporting limits were reported for volatile analyses in several ground water samples based on sample dilutions performed prior to analysis. Dilutions were performed by the laboratory based on historical data and are documented on the data validation summary tables. Sample dilutions were performed at the appropriate levels.

**Overall data assessment.** Volatile analyses and their respective QC procedures were performed in accordance with analytical method and QAPP requirements. Volatile data are useable for qualitative and quantitative purposes. Data were qualified as approximate for vinyl chloride in samples ECJ-2-47 and DUP1(ECJ-2-47) based on a minor excursion from field duplicate requirements.

#### 4.2. PCB analyses

Seven ground water, seven ground water treatment plant influent, and associated QC samples were analyzed and validated for PCBs. The following QA/QC parameters met criteria or did not result in qualification of data:

- Holding times and sample preservation
- Initial and continuing calibration
- Blank analysis
- Surrogate recovery and retention time shift
- Internal standard analysis

- MS/MSD analysis
- Field duplicate analysis
- LCS analysis
- System performance
- Documentation completeness

**Target compound identification, quantitation, and reporting limits.**

Based on 100% review of the data, the laboratory performed identification in accordance with method requirements. For the majority of samples in which PCBs were detected, the laboratory documented that the PCB Aroclors that were identified exhibited an altered pattern. Samples that exhibited altered PCB patterns have been identified in data validation summary tables, included as Appendix A. Based on review of the raw data, peaks were present within retention time windows established for the identified PCB Aroclors on both primary and confirmation columns utilized by the laboratory. The pattern did not match with respect to peak ratios. The Aroclors that were identified by the laboratory represent the closest match. Therefore, additional qualification of data with respect to PCB Aroclor identification was not required.

The internal standard method was utilized for quantitation for primary and confirmation analyses. Based on review of ten percent of the data, PCB aroclor quantitation was performed in accordance with method requirements. PCB concentrations were above the linear calibration range for samples OBG-1, OBG-2, BEI-1, MW-24, and MW-2. These samples were diluted and reanalyzed and the results were reported from the diluted run as appropriate. Percent difference (%D<40%) requirements for two column results were met.

**Overall data assessment.** PCB analyses and QA/QC procedures were performed in accordance with analytical method and QAPP requirements. PCB data are useable for qualitative and quantitative purposes without further qualification.

#### 4.3. Metal analyses

Seven treatment plant influent and associated QC samples were analyzed and validated for the following selected metals: aluminum, barium, chromium, copper, iron, lead, vanadium, and zinc. The following QA/QC parameters met criteria or did not result in qualification of data:

- Holding times and sample preservation
- Initial and continuing calibration
- Blank analysis
- Interference check standard analysis
- Matrix spike analysis
- Laboratory duplicate analysis
- Serial dilution analysis

- LCS analysis
- Field duplicate analysis
- Analyte quantitation and reporting limits
- Documentation completeness

**Overall data assessment.** The laboratory performed metal analyses and QA/QC procedures in accordance with analytical method and QAPP requirements. Metals data are usable for qualitative and quantitative purposes without further qualification.

---

## 5. Data usability

Analytical data were validated for samples collected from the Sullivan's Ledge Site in New Bedford, Massachusetts. Ground water samples and ground water treatment plant influent samples were validated for selected volatile organic compounds, PCBs and selected metals based on accuracy and precision criteria specified in documents referenced in Section 1. When excursions were observed from QA/QC requirements, the analytical data were qualified based on guidance provided in the USEPA Region I validation guidelines (USEPA Region I, November 1988, February 1989, and December 1996).

[Minor deficiencies in the data generation process resulted in approximation of sample data clarified.] Approximation of a data point indicates uncertainty in the reported concentration of the analyte, but not its assigned identity. The conservative assumptions used in the development of conclusions based on the analytical data verifies that approximated analytical data adheres to the project data quality objectives. This approach to the use of analytical data is consistent with the guidance presented in the *USEPA Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)*, 540/1-89/002 (USEPA, December 1992).

This section summarizes the adherence of the analytical data to the data quality objectives (DQOs) established in the QAPP for precision, accuracy, representativeness, comparability, completeness, and sensitivity. A detailed discussion of the analytes and samples that were qualified is presented in Section 4. Summary tables of validated sample results with data validation qualifiers have been provided in Appendix A of this report.

Data quality objectives were evaluated using percent usability, defined as the percentage of sample results that are usable for qualitative and quantitative purposes.

*Precision* was assessed from laboratory MSD and field duplicate analyses. Data usability with respect to precision was calculated as 100%. Detected results were qualified as approximate for vinyl chloride in field duplicate samples collected from ECJ-2-47.

*Accuracy* was assessed from GC/MS tuning, calibration, surrogate recovery, internal standard performance MS/MSD, and LCS data. Data usability with respect to accuracy was calculated as 100%.

*Representativeness* was assessed from holding times, sample preservation, blank analysis, target compound identification and quantitation, and sampling and analytical methodologies used. Data usability with respect to representativeness was 100%.



*Comparability* is a qualitative measure, therefore, usability calculations were not performed. Comparability requirements were met since standard analytical methods, reporting units, reference materials, and data deliverables were utilized by the laboratory.

*Sensitivity* requirements were met overall. Laboratory reporting limits were elevated for volatile organic compounds in the majority of samples based on the laboratory dilutions performed to obtain concentrations within the linear calibration range. Sample dilutions were performed in accordance with method requirements and were based on historical data.

*Data completeness* was calculated as 100%, exceeding the 95% requirement established in the QAPP.

**Validated Results**



**Table 1**  
**Sullivan's Ledge Superfund Site**  
**Ground Water Samples**  
**Method 8260B Volatile Organic Compound Data**

Compound	Sample ID	BEI-1	BEI-2	BEI-2 Dup	BEI-3	OBG-1	OBG-2	OBG-3	Collection Trench	ECJ-1-37	ECJ-1-62
	SDG ID	L0302418	L0302418	L0302418	L0302418	L0302418	L0302418	L0302484	L0302418	L0302418	L0302418
	Dilution Factor	500	200	100	1 and 67	500	100	50	1	1	20
	Sample Date	03/18/03	03/18/03	03/18/03	03/18/03	03/18/03	03/18/03	03/19/03	03/18/03	03/18/03	03/18/03
	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
1,4-Dichlorobenzene		1200 U	500 U	250 U	2.5 U	1200 U	250 U	120 U	5.4	2.5 U	50 U
Benzene		250 U	100 U	85	10	330	360	39	62	1.7	10 U
Chlorobenzene		250 U	110	100	2.5	250 U	240	70	45	4.6	10 U
Ethylbenzene		1300	170	180	56	840	150	25 U	13	6	10 U
Naphthalene		1200 U	500 U	250 U	2.5 U	1200 U	250 U	120 U	12	2.5 U	50 U
Toluene		840	150 U	75 U	8.8	990	120	38 U	0.75 U	3.9	15 U
Trichloroethene		8400	100 U	50 U	970	380	56	160	0.5 U	0.5 U	10 U
Vinyl chloride		830	1100	1100	170	840	500	120	1 U	2.1	550
cis-1,2-Dichloroethene		22000	5900	5900	4200	18000	4800	1500	1.7	2	800
o-Xylene		250 U	100 U	50 U	0.5 U	250 U	50 U	25 U	1	0.5 U	10 U
m,p-Xylenes		250 U	100 U	50 U	0.5 U	250 U	50 U	25 U	2.8	0.5 U	10 U
trans-1,2-Dichloroethene		380 U	150 U	75 U	19	380 U	75 U	38 U	0.75 U	0.75 U	15 U

NOTES: U - not detected, J - estimated value, R - unusable, -- - not analyzed.  
Dup - references blind field duplicate sample that was collected. Lab Dup - laboratory duplicate analyses conducted.



**O'BRIEN & GERE**  
ENGINEERS, INC.

Table 1  
Sullivan's Ledge Superfund Site  
Ground Water Samples  
Method 8260B Volatile Organic Compound Data

Sample ID	ECJ-1-72	ECJ-1-122	ECJ-1-148	ECJ-2-47	ECJ-2-47 Dup	ECJ-2-82	ECJ-2-117	ECJ-2-152	ECJ-2-187	GCA-1
SDG ID	L0302418	L0302418	L0302418	L0302418	L0302418	L0302418	L0302418	L0302418	L0302418	L0302484
Dilution Factor	500	100	1000	40	20	500	200	500	200	2
Sample Date	03/18/2003	03/18/2003	03/18/2003	03/17/2003	03/17/2003	03/17/2003	03/17/2003	03/17/2003	03/17/2003	03/19/2003
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Compound										
1,4-Dichlorobenzene	1200 U	250 U	2500 U	100 U	50 U	1200 U	500 U	1200 U	500 U	9.9
Benzene	250 U	340	500 U	20 U	10 U	250 U	110	250 U	100 U	110
Chlorobenzene	250 U	170	500 U	20 U	17	250 U	100 U	250 U	100 U	57
Ethylbenzene	1200	380	1500	20 U	10 U	1200	1700	1200	760	2.9
Naphthalene	1200 U	250 U	2500 U	100 U	50 U	1200 U	500 U	1200 U	500 U	6.8
Toluene	600	75 U	880	30 U	15 U	1200	1600	1900	850	1.6
Trichloroethene	250 U	50 U	500 U	20 U	12	250 U	100 U	250 U	100 U	1 U
Vinyl chloride	20000	1100	2800	490 J	730 J	12000	22000	23000	12000	17
cis-1,2-Dichloroethene	39000	4300	28000	1200	1400	250 U	10000	36000	11000	57
o-Xylene	250 U	50 U	500 U	20 U	10 U	250 U	100 U	250 U	100 U	2.3
m,p-Xylenes	250 U	50 U	500 U	20 U	10 U	250 U	100 U	250 U	100 U	4.6
trans-1,2-Dichloroethene	380 U	75 U	750 U	30 U	15 U	380 U	150 U	380 U	150 U	1.5 U

NOTES: U - not detected, J - estimated value, R - unusable, — - not analyzed.  
Dup - references blind field duplicate sample that was collected. Lab Dup - laboratory duplicate analyses conducted.









**O'BRIEN & GERE**  
ENGINEERS, INC.

**Table 3**  
**Sullivan's Ledge Superfund Site**  
**Ground Water Samples**  
**Method 6010B/7470A Inorganic Data**

Compound	Sample ID	BEI-1	BEI-2	BEI-2 Dup	BEI-3	OBG-1	OBG-2	OBG-3	Collection Trench
	SDG ID	L0302418	L0302418	L0302418	L0302418	L0302418	L0302418	L0302484	L0302418
	Dilution Factor	1	1	1	1	1	1	1	1
	Sample Date	03/18/03	03/18/03	03/18/03	03/18/03	03/18/03	03/18/03	03/19/03	03/18/03
	Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Matrix	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Aluminum		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.15
Barium		0.52	0.68	0.69	0.13	1.2	1.6	0.73	0.78
Chromium		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01
Copper		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Iron		52	64	65	2	46	72	84	75
Lead		0.008	0.01	0.012	0.005 U	0.007	0.012	0.005 U	0.017
Vanadium		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Zinc		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.3	0.05 U

**NOTES:** U - not detected, J - estimated value, R - unusable, — - not analyzed.  
Dup - references blind field duplicate sample that was collected. Lab Dup - laboratory duplicate analyses conducted.







**O'BRIEN & GERE**  
ENGINEERS, INC.

June 17, 2003

Mr. David O. Lederer  
Remedial Project Manager  
Environmental Protection Agency (HBO)  
Region 1  
1 Congress Street, Suite 1100  
Boston, MA 02114-2023

Re: Sullivan's Ledge Superfund Site  
Quarterly Ground Water  
Sampling Event – Spring 2003

File: 5509/28602 #2

Dear Dave:

Please find enclosed for your review the Quarterly Ground Water Sampling Event – Spring 2003. Please contact Jim Heckathorne or me if you have any questions concerning this document.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC

Judy A. Shanahan, PE  
Senior Project Engineer

I:\DIV71\Projects\5509\28602\2\_corres\SpringLEDER.doc  
Attachment

cc: S. Wood E. Vaughn S. Alfonse P. Steinberg  
E. Bertaut D. Dwight M. Wade G. Swenson  
J. Heckathorne



O'Brien & Gere Engineers, Inc., an O'Brien & Gere company  
5000 Brittonfield Parkway / P.O. Box 4873, Syracuse, New York 13221-4873  
(315) 437-6100 / FAX (315) 463-7554 • [http:// www.obg.com](http://www.obg.com)  
... and offices in major U.S. cities